# FISCAL YEARS 1983 AND 1984 ENVIRONMENTAL PROTECTION AGENCY RESEARCH AND DEVELOPMENT AUTHORIZATION

## HEARINGS

BEFORE THE

## SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH AND ENVIRONMENT

OF THE

## COMMITTEE ON SCIENCE AND TECHNOLOGY U.S. HOUSE OF REPRESENTATIVES

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# FISCAL YEARS 1983 AND 1984 ENVIRONMENTAL PROTECTION AGENCY RESEARCH AND DEVELOPMENT AUTHORIZATION

WEDNESDAY, FEBRUARY 24, 1982

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURE RESEARCH AND ENVIRONMENT,
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 2:14 p.m., in room 2325, Rayburn House Office Building, Hon. James Scheuer (chairman of the subcommittee) presiding.

Present: Representatives Scheuer, Brown, Walgren, Carney, and Schneider.

Mr. SCHEUER. The Subcommittee on Natural Resources, Agricultural Research, and Environment will come to order.

Today we are beginning our formal consideration of the fiscal year 1983 budget for the research programs of EPA. This budget request totaling $216 million is extraordinarily lean. And in the view of some of us it is painfully inadequate. Without taking inflation into account at all, without any consideration of real dollars, this request represents a more than 37-percent reduction from the $343 million spent by EPA on 1981 research, down to $216 million for 1983. This is a reduction of over $100 million, about 30 percent of the budget without considering the eroding effect of inflation over those 2 years.

If one considers that our environment statutes assume that environmental protection will be achieved through standards and regulations based on scientific and technical information, a severely weakened research program at EPA threatens the very foundation of environmental protection in this country.

Now we realize, all of us, that levels of funding are not the only factor affecting the strength and capabilities of EPA's environment research team.

Program direction, program quality, management and organization are all important factors. Of course, the subcommittee will examine each of these closely in connection with our scrutiny of the fiscal year 1983 budget proposal.

One aspect of the administration's proposal which especially disturbs me is the research they contemplate in connection with energy development activities. The fiscal year 1983 request for energy-related research is $34.5 million. This funding level represents a $65 million reduction, or a two-thirds cut from 1981 fund-

ing. And this, too, does not take into account the eroding effects of inflation.

This withdrawal in energy environment research does not appear to me to be sound public policy. This country is experiencing an energy transition like no other in our history. The cost of this change from the standpoint of its effect on public health and environment quality could be enormous if we don't give proper attention to the environmental impacts of this transition.

We are in the midst of a tremendous push in our country to free us from our present supine dependence upon Persian Gulf oil. We are engaged in a tremendous push to utilize our coal resources, to get involved in all kinds of renewable energy sources, be they wave-tidal, solar, geothermal, or biomass. We are involved in a major synfuels program. All this will cost many billions of dollars by the time they are completed.

For us to be engaged in these programs without spending sums amounting to a fraction of 1 percent of their development cost, to ascertain their future effect of public health and our environment, seems to me to be absolutely mindless.

For us to be in the business of producing vast new sources of energy and knowing the need for laying out all kinds of standards and antipollution requirements in industry without fine tuning our thinking, without knowing how to make our standards and mandatory controls cost effective, without knowing as a scientific, verifiable fact that the benefits will be substantially greater than the cost, seems to me to be flying absolutely in the face of everything that President Reagan has been telling us about the need for an intelligent and cost effective regulatory control system.

I think many of us are deeply concerned about this two-thirds slash in energy R. & D.

Now, this policy change is one of the many significant and unprecedented changes sought by this administration in its fiscal year 1983 EPA budget request for research. One cannot help but have the suspicion that, taking all of these threads together, this implies a fundamental redefinition of the role of research in EPA.

Our task, and it is a very difficult one in this time of deeply felt constraints on resources, is to evaluate this proposal and reach a decision of the proper direction of funding for the EPA research program.

We have some outstandingly fine witnesses scheduled for this afternoon, many of whom have been here several times before and have given us the benefit of their creativity and their outstanding grasp of these problems.

I want to thank each and every one of them, not only for their past contributions but for the contributions they will make today to our thinking.

At this time, I would like to turn to our very distinguished ranking minority member from the State of New York, Bill Carney.

Mr. CARNEY. Thank you, Mr. Chairman.

Today does mark the beginning of a very important series of hearings addressing the fiscal year 1983 budget request for the research and development programs of the EPA. We are all aware, in the fiscal year 1983 budget request, of the drastic level of cutbacks that have occurred within EPA since 1981.

In evaluating the budget request, I assure you that this subcommittee will address the role of the Agency, its program direction and its ability to carry out its responsibilities in protecting the health of the people and the integrity of our national environment.

Our present administration has committed itself to the people of this Nation to rid the Government of its bureaucratic waste. With the estimated fiscal year 1983 budget national deficit of $90 to $100 billion, it has become necessary for Congress to reevaluate the role of the Government and its agency. This is a complicated task and one that requires the dedication of every Member of Congress.

It is imperative that this subcommittee review the R. & D. program within the EPA to assure that we are proceeding in the proper direction with the levels of funding that can support this achievement. I can say I believe every member shares that same concern.

The Environmental Protection Agency, which was founded under a Republican administration, has enjoyed bipartisan support in the Congress since its inception. I assure you that that same support exists today in this Congress.

We have before us today, as you said, Mr. Chairman, five very prominent and highly qualified witnesses to assist us in our efforts to maintain quality within that agency.

I thank them for coming before us today and look forward to their testimony and contribution.

Thank you, Mr. Chairman.

Mr. SCHEUER. Thank you very much, Mr. Carney.

Congressman Brown of California?

Mr. BROWN. I have nothing to say.

Mr. SCHEUER. Congressman Walgren?

Mr. WALGREN. I have nothing, Mr. Chairman.

Mr. SCHEUER. Mrs. Schneider?

Mrs. SCHNEIDER. No. Thank you, Mr. Chairman.

Mr. SCHEUER. We will come directly to our first witness, a very familiar figure before this subcommittee, Dr. Russell Peterson. Dr. Peterson has had a long and distinguished career that includes service as a Du Pont executive, as chairman of the President's Council on Environmental Quality, as head of the Office of Technology Assessment, Governor of Delaware and now, as president of the National Audubon Society.

Dr. Peterson, you have benefited this committee many times with your fine, lucid testimony in the past and we are looking forward with great pleasure to hearing from you today.

Your prepared remarks will be printed in their entirety at this point in the record, and now please take such time as you may need.

## STATEMENT OF DR. RUSSELL W. PETERSON, PRESIDENT, THE NATIONAL AUDUBON SOCIETY

Dr. PETERSON. Thank you, Mr. Chairman, members of the committee. I appreciate very much the opportunity to come here today to talk about the serious problem of operating Research and Development in EPA.

President Reagan's budget for fiscal year 1983, as you pointed out, Mr. Chairman, calls for another major cut in the Environment Protection's R. & D. program, a 33-percent reduction in real dollars this time.

This action runs counter to the contention of his administration, and many of the polluting industries, that we do not know enough about the environmental hazards and their health, ecological, and economic effects to justify the implementation of several Environmental Protection measures.

The administration is saying one thing and doing quite another.

It is certainly true that we are woefully ignorant of the various effects of the thousands of man-made pollutants that now contaminate our environment. We do know enough, however, to be well aware that this contamination of our Earth constitutes a serious threat to the quality of our lives and especially that of future generations.

The people of our country recognize this, and as poll after poll shows, 80 to 90 percent of them demand that measures be taken to protect their environment even if it costs them more money.

Some claim that we can't afford to clean up our environment, especially during this difficult period when our Government is giving top priority to massive reductions in taxes and to a crash program to build up our military.

I say we cannot afford not to protect our air, water, and land. Even ignoring the great contributions our Nation's environmental regulations have made to healthy and happy lives, and to a productive and attractive land, facts clearly show that these regulations have had a major positive impact on our economy, creating hundreds of thousands of jobs and many investment opportunities.

During this serious recession, it is especially important to capitalize on the market stimulating and job creating effects of an accelerated cleanup of our environment.

Having spent 26 years launching new ventures for the Du Pont Co., I know the key to capitalizing on such opportunities is a strong and vigorous R. & D. effort. Coupling this conviction with the awareness of the great lack of knowledge in the environmental protection field and the shameful abundance of antiknowledge that plagues decisionmaking in this area, I strongly encourage you Members of Congress to triple the $216 million that President Reagan has budgeted for EPA's R. & D. effort in fiscal year 1983.

This would bring the budget in real dollars just slightly above what it was in 1979. And, all you would have to do to avoid this change impacting on the overall budget would be to delete one B–1 bomber.

It is helpful, I believe, to put the EPA budget in perspective to compare it with what is proposed by President Reagan for R. & D. in the Department of Defense and in the National Aeronautics and Space Administration.

The proposed Department of Defense budget for R. & D. is 100 and 10 times as large as the EPA budget for R. & D. In fact, the increase alone in the Department of Defense R. & D. budget is 17 times as much as the total R. & D. budget for EPA.

The proposed R. & D. budget for exploring space will be 28 times that for EPA's R. & D.

I ask you, where are our priorities?

Astronomical sums to prepare to blow up the Earth and to explore extraterrestrial space while we drastically cut a relatively tiny budget for studying of our life-support systems here on Earth!

Nowhere is the inconsistency of the administration's approach, the cynical claim that we lack the scientific data for environment regulation while they are eliminating the means to develop this data—nowhere is the Orwellian double speak more evident than in the area of energy development.

The production and use of energy is the principal cause of environmental degradation in this country. Nearly all the pollutants for which we have Government regulations come from these sources. Sulfur dioxide, nitrogen oxides, carbon monoxide, particulates, hydrocarbons, and radioactive materials.

The administration would cut EPA's energy research budget as you pointed out, Mr. Chairman, from $84 million in 1981 to $34 million in 1983. That is undercutting the agency's ability to develop new pollution-control technology and essentially ending research on the ecological effects of energy production.

The two energy R. & D. programs, both of which are in the Department of Energy, that would help most in getting our society on the path toward benign and economical energy sources—that is solar energy and energy conservation—are cut 65 and 76 percent on top of the large cuts of last year.

It seems that the programs that make the most sense, environmentally and economically, are singled out for extinction.

I ask you, what is going on?

I would also like to ask you to remember that while most agencies can do harm only by acting—like Secretary Watt of Interior when the courts and the Congress can stop him if they don't like it—EPA can do harm by not acting.

Mr. SCHEUER. Would you like to explain that? Can you elaborate on that? I assume you are referring to the lack of organic legislation.

Dr. PETERSON. No. What I am talking about is that EPA is there to enforce the laws of the land, to keep people out in our general society from doing things that will harm the environment. And if they don't act to enforce the laws, as the case now, then they are doing harm by not acting.

Mr. SCHEUER. I thought you were referring to the fact, and maybe you will refer to it later. We have difficulty forcing them to act since it is an agency that does not have the structural legislation that gives them a specific mission.

Dr. PETERSON. I think it would be good to have some sort of organizational setup so that that could be done. At this time, regardless of whether or not you give them dollars, if the agency's leadership doesn't want things to happen——

Mr. SCHEUER. They do not have an organic enabling act, so to speak, that would give them their specific mission that would enable us to hold their feet to the fire in performing that mission.

Please continue.

Dr. PETERSON. Let's get back to my recommendation that you give EPA more R. & D. dollars.

Probably the most critical need is to stop the loss of the talent and expertise that has been built up with great difficulty over the last 12 years. For 7 of those years, from the time I became head of the President's Council on Environmental Quality in 1973 until the Reagan administraton came in, I was in close contact with EPA's R. & D. team. I know of their struggle to recruit talented scientists from all around the country, to get their laboratories equipped and train their new staff to become a multidisciplinary team working in an extremely complicated field.

By 1980 the staff was just beginning to become an effective, smoothly working team, allied with numerous universities and private laboratories, working under contract with EPA and thereby providing our country with a network of institutions capable of coping with this complex field.

It constituted a major investment for America, an investment essential to resolving our serious environmental problems.

Now, the Reagan administraton is trying to scuttle it. Already too many talented people have been lost. The morale is unbelievably terrible. You must not let any more destruction go on there.

I do not think it an overstatement to say that the Reagan administration is attempting a coup in EPA, attempting to force their ideology against the laws of the land. I encourage the Congress to investigate indepth what is going on there.

If the Reagan administration succeeds in its plans, it could take another decade to rebuild EPA's R. & D. staff. The pendulum will certainly swing back. The people will not tolerate such backward action long. But, when the pendulum does swing back, the eagerness to make up for lost time will put us back where we were in the 1970's, with EPA forced by congressionally mandated deadlines to make decisions without the scientific basis for doing so.

The Toxic Substance Control Act was passed by Congress as you well know in 1976 to screen toxic from nontoxic chemicals and to protect the public from those chemicals found to endanger public health. If this law is going to work, more R. & D.—not less—is needed. We don't know the fate or effect of these materials. In fact, we don't even have good, reliable inexpensive monitoring techniques for many of them.

If anything, R. & D. needs are even more critical in the area of hazardous wastes. Here the problems of monitoring, multiple exposure, and risk assessment are compounded. R. & D. efforts in mitigation and cleanup are at a primitive stage, technically. We are trying to deal with 20th century problems using 19th century techniques * * * dumping our wastes into our air, water, and land.

The Surgeon General has reported that toxic wastes pose one of the great threats to the health of American citizens in the 1980's. The problems of hazardous wastes are accelerating. Yet the administration has budgeted no more R. & D. money for this purpose than it did last year. And the budget for toxic substances has been sharply reduced.

We know very little about the impact of pollutants on plant life, but the evidence indicates it could be high. For example, the National Crop Loss Assessment just completed by EPA shows that the loss for just four crops from just one form of air pollution, ozone, amounts to $3 billion annually.

Yet, EPA's air pollution research, which includes the study that uncovered the ozone losses, would be cut by $23 million, more than one-third its 1981 level.

Then there is the matter of ground water, the drinking water supply for about half of the people in this country. The ground water is particularly susceptible to contamination and toxic wastes. Many water supplies have already been degraded by organic chemicals such as halogenated hydrocarbons and by heavy metals such as chromium.

Many more sources of drinking water are currently threatened as toxic wastes seep toward them. The contamination of the Nation's drinking water is a serious and growing problem.

It may also be an irreversible problem. Once our underground reservoirs become contaminated, they will stay that way for a very long time. To solve this problem, we must better understand it. Ignoring this need, the administration is proposing substantial cuts in an already inadequate R. & D. effort.

The most serious toxic waste problem of them all—radioactive waste—worsens daily, with no significant commitment to deal with it. As the U.S. Comptroller General has pointed out, the Federal Government has never articulated a firm policy on how it intends to manage, over the long term, either Federal or commercial nuclear wastes.

What better agency to study the health and environmental implications of radioactive wastes than the Environmental Protection Agency.

The decision in 1975 to take the prime responsibility for protection against nuclear pollutants out of EPA and transfer it to a producer of nuclear wastes—ERDA—should now be reversed.

The President's plan to get rid of the Department of Energy should facilitate such a correction.

EPA is responsible for producing guidelines for the Nuclear Regulatory Commission dealing with the disposal of radioactive wastes. The guidelines were due 4 years ago. I know that the reason for the delay was that EPA was never given the expertise to do the job.

The latest word is that these guidelines will be ready this spring—maybe.

Sulfur dioxide and nitrogen oxide emissions are damaging human health, destroying property, and killing fish life in increasing numbers of lakes and ponds in this country and Canada and throughout much of the world.

We need to develop coal burners that reduce both sulfur dioxide and nitrogen oxide emissions. EPA has such a development in the pilot-plan phase, a promising project that can cut costs markedly for utilities, but a project which is now languishing for lack of funds.

The Germans and Japanese are making a major push to develop equipment for effective pollution controls. They recognize the vast and profitable market for them, just as they did for the small car. They will likely take this market potential away from us, increasing jobs and earnings in Japan.

EPA's R. & D. budget must not be cut from $278 million this year to $216 million in fiscal year 1983 as the Reagan administration proposes.

At a time when EPA's responsibilities are multiplying, when population and industrial growth are putting increasing stress on our environment, the Agency's R. & D. budget must keep pace. For EPA to do its congressionally mandated job, to continue the nationwide environmental cleanup that it started out to do, to safeguard the Nation's investment in its talented R. & D. staff, the President's proposed R. & D. budget should be tripled—that is, raised to $650 million.

This compares with a budget of $540 million in 1983 dollars back in 1979, when EPA's congressionally mandated assignment was much less.

As I stated earlier, the impact of this change on the President's total budget could be balanced by deleting one B–1 bomber.

The subject on your agenda today can be boiled down to two simple questions:

Will we leave future generations a poisoned, wasted Earth as a legacy of this generation's shortsightedness or will we pass on to them a bountiful, beautiful, uncontaminated Earth, the lasting returns from the wise investments of today.

I hope and trust that you—you Members of Congress—will keep our country on the life-supporting path by giving the Environmental Protection Agency the funds it needs to do the job you created it to do, and then seeing to it that the Reagan administration properly fulfills this mandate.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Peterson follows:]

TESTIMONY BY RUSSELL W. PETERSON, PRESIDENT, THE NATIONAL AUDUBON SOCIETY

SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH AND ENVIRONMENT
COMMITTEE ON SCIENCE AND TECHNOLOGY
U. S. HOUSE OF REPRESENTATIVES

AUTHORIZATION HEARINGS ON FY 1983 RESEARCH PROGRAM AND BUDGET REQUEST
ENVIRONMENTAL PROTECTION AGENCY

February 24, 1982

PRESIDENT REAGAN'S BUDGET FOR FISCAL 1983 CALLS FOR ANOTHER MAJOR CUT IN THE ENVIRONMENTAL PROTECTION AGENCY'S R&D PROGRAM--A 33 PERCENT REDUCTION IN REAL DOLLARS THIS TIME.

THIS ACTION RUNS COUNTER TO THE CONTENTION OF HIS ADMINISTRATION AND MANY OF THE POLLUTING INDUSTRIES THAT WE DO NOT KNOW ENOUGH ABOUT THE ENVIRONMENTAL HAZARDS AND THEIR HEALTH, ECOLOGICAL AND ECONOMIC EFFECTS TO JUSTIFY THE IMPLEMENTATION OF SEVERAL ENVIRONMENTAL PROTECTION MEASURES.

THE ADMINISTRATION IS SAYING ONE THING AND DOING QUITE ANOTHER.

IT IS CERTAINLY TRUE THAT WE ARE WOEFULLY IGNORANT OF THE VARIOUS EFFECTS--SHORT-TERM AND LONG-TERM--OF THE THOUSANDS OF MAN-MADE POLLUTANTS THAT NOW CONTAMINATE OUR ENVIRONMENT, AND OF THE MANY MILLIONS OF TONS OF ADDITIONAL CONTAMINANTS THAT CONTINUE TO BE SPEWED ANNUALLY INTO OUR AIR, WATER AND LAND.

WE DO KNOW ENOUGH, HOWEVER, TO BE WELL AWARE THAT THIS CONTAMINATION OF OUR EARTH CONSTITUTES A SERIOUS THREAT TO THE QUALITY OF OUR LIVES AND ESPECIALLY THAT OF FUTURE GENERATIONS.

IT THREATENS ALL LIFE--HUMAN, PLANT AND ANIMAL--AND THE SUPPORT SYSTEMS ESSENTIAL TO LIFE.

THE PEOPLE OF OUR COUNTRY RECOGNIZE THIS AND AS POLL AFTER POLL SHOWS, 80-90 PERCENT OF THEM DEMAND THAT MEASURES BE TAKEN TO PROTECT THEIR ENVIRONMENT EVEN IF IT COSTS THEM MORE MONEY.

YET SOME STILL CLAIM THAT WE CAN'T AFFORD TO CLEAN UP OUR ENVIRONMENT,
ESPECIALLY DURING THIS DIFFICULT PERIOD WHEN OUR GOVERNMENT IS GIVING TOP PRIORITY
TO MASSIVE REDUCTIONS IN TAXES AND TO A CRASH PROGRAM TO BUILD UP OUR MILITARY.
I SAY WE CAN'T AFFORD NOT TO PROTECT OUR AIR, WATER AND LAND.
EVEN IGNORING THE GREAT CONTRIBUTIONS OUR NATION'S ENVIRONMENTAL REGULATIONS HAVE MADE
TO HEALTHY AND HAPPY LIVES AND TO A PRODUCTIVE AND ATTRACTIVE LAND,
THE FACTS CLEARLY SHOW THAT THESE REGULATIONS HAVE HAD A MAJOR POSITIVE IMPACT
ON OUR ECONOMY--CREATING HUNDREDS OF THOUSANDS OF JOBS AND MANY INVESTMENT OPPORTUNITIES.
DURING THIS SERIOUS RECESSION, IT IS ESPECIALLY IMPORTANT TO CAPITALIZE
ON THE MARKET-STIMULATING AND JOB-CREATING EFFECTS OF AN ACCELERATED CLEAN-UP
OF OUR ENVIRONMENT.
JUST AS OUR DESIRE FOR COOL AIR TO MAKE US MORE COMFORTABLE LED TO
A PROSPEROUS AIR CONDITIONING INDUSTRY, SO, FOR EXAMPLE, CAN THE PEOPLE'S DEMAND
FOR CLEAN AIR TO MAKE US MORE HEALTHY LEAD TO A PROSPEROUS AIR CLEANING INDUSTRY.
THE EXISTING MARKETS FOR THE CATALYTIC CONVERTOR FOR AUTOMOBILES
AND THE AIR SCRUBBERS FOR UTILITY AND INDUSTRIAL STACKS ILLUSTRATE THIS POINT.

HAVING SPENT 26 YEARS LAUNCHING NEW VENTURES FOR THE DUPONT COMPANY,
I KNOW THAT THE KEY TO SUCCESS IN DEVELOPING SUCH NEW MARKETS
IS A STRONG AND VIGOROUS R&D EFFORT.
COUPLING THIS CONVICTION WITH THE AWARENESS OF THE GREAT LACK OF KNOWLEDGE
IN THE ENVIRONMENTAL PROTECTION FIELD AND THE SHAMEFUL ABUNDANCE
OF ANTI-KNOWLEDGE THAT PLAGUES DECISION-MAKING IN THIS AREA,
I STRONGLY ENCOURAGE YOU MEMBERS OF CONGRESS TO TRIPLE THE $216 MILLION
PRESIDENT REAGAN HAS BUDGETED FOR EPA'S R&D EFFORT IN FISCAL 1983.
THIS WOULD BRING THE BUDGET IN REAL DOLLARS JUST SLIGHTLY ABOVE WHERE IT WAS IN 1979.
AND ALL YOU WOULD HAVE TO DO TO AVOID THIS CHANGE IMPACTING ON THE OVERALL BUDGET
WOULD BE TO DELETE ONE B-1 BOMBER.

IT IS HELPFUL I BELIEVE TO PUT THE EPA BUDGET IN PERSPECTIVE TO COMPARE IT WITH WHAT IS PROPOSED BY PRESIDENT REAGAN FOR R&D IN THE DEPARTMENT OF DEFENSE AND IN THE NATIONAL AERONAUTIC AND SPACE ADMINISTRATION.

THE PROPOSED DEPARTMENT OF DEFENSE BUDGET FOR R&D IS 110 TIMES AS LARGE AS THE EPA BUDGET FOR R&D.

IN FACT, THE INCREASE--THE INCREASE ONLY--IN THE DEPARTMENT OF DEFENSE R&D BUDGET IS 17 TIMES AS MUCH AS THE TOTAL R&D BUDGET FOR EPA.

THE PROPOSED R&D BUDGET FOR EXPLORING SPACE WILL BE 28 TIMES THAT FOR EPA'S R&D.

WHERE ARE OUR PRIORITIES?

ASTRONOMICAL SUMS TO PREPARE TO BLOW UP THE EARTH AND TO EXPLORE EXTRATERRESTRIAL SPACE WHILE WE DRASTICALLY CUT A RELATIVELY TINY BUDGET FOR STUDYING THE THREATS TO OUR LIFE-SUPPORT SYSTEMS HERE ON EARTH!

BASIC RESEARCH, AS YOU KNOW, IS THE SEARCH FOR KNOWLEDGE. AS I PREVIOUSLY EMPHASIZED, WE DESPERATELY NEED MORE KNOWLEDGE IN EPA'S AREA OF ASSIGNMENT.

THE INTERDEPENDENCE AND INTERACTION OF ENVIRONMENTAL FACTORS WITH POPULATION AND RESOURCE MATTERS, AND THE LONG-TERM IMPACTS OF SUCH INTERACTIONS ON THE SOCIAL AND ECONOMIC HEALTH OF OUR COUNTRY ARE EXTREMELY COMPLEX ISSUES FOR WHICH NO GOVERNMENTAL INSTITUTION IN OUR COUNTRY IS EQUIPPED TO MAKE A SIGNIFICANT CONTRIBUTION.

IT IS FUNDAMENTALLY IMPORTANT THAT EPA BE GIVEN THE RESOURCES TO BUILD A FOUNDATION OF KNOWLEDGE IN THIS AREA.

YET WHAT ARE THEY PROVIDED FOR BASIC RESEARCH IN THE PRESIDENT'S BUDGET? ONLY $10 MILLION, A 33 PERCENT REDUCTION FROM THE CURRENT FISCAL YEAR.

IT MAY BE OF PASSING INTEREST THAT THE ONLY OTHER AGENCY TO HAVE ITS BASIC RESEARCH BUDGET CUT IS THE DEPARTMENT OF THE INTERIOR.

THE DEPARTMENT OF DEFENSE'S BASIC RESEARCH BUDGET GETS INCREASED BY $108 MILLION, WHILE THAT OF NASA GETS INCREASED BY $102 MILLION. IN BOTH CASES THE INCREASE IS OVER TEN TIMES THE TOTAL BASIC RESEARCH BUDGET FOR EPA. AGAIN I ASK, "WHERE ARE OUR PRIORITIES?"

NOWHERE IS THE INCONSISTENCY OF THE ADMINISTRATION'S APPROACH--THE CYNICAL CLAIM THAT WE LACK THE SCIENTIFIC DATA FOR ENVIRONMENTAL REGULATION WHILE THEY ARE ELIMINATING THE MEANS TO DEVELOP THIS DATA--NOWHERE IS THE ORWELLIAN DOUBLE-SPEAK MORE EVIDENT THAN IN THE AREA OF ENERGY DEVELOPMENT.

THE PRODUCTION AND USE OF ENERGY IS THE PRINCIPAL CAUSE OF ENVIRONMENTAL DEGRADATION IN THIS COUNTRY. THE MINING AND BURNING OF COAL, THE PROCURING AND BURNING OF OIL, THE DEVELOPMENT OF COAL SLURRY, OIL SHALE AND SYNFUELS--ALL POSE SERIOUS THREATS TO HUMAN HEALTH AND TO THE INTEGRITY OF THE NATURAL ENVIRONMENT. NEARLY ALL OF THE POLLUTANTS FOR WHICH WE NOW HAVE GOVERNMENT REGULATIONS COME FROM THESE SOURCES--$SO_2$, $NO_x$, CO, PARTICULATES, HYDROCARBONS AND RADIOACTIVE MATERIALS.

YET THE ADMINISTRATION WOULD CUT EPA's ENERGY RESEARCH BUDGET FROM $84 MILLION IN 1981 TO $52 MILLION IN 1982 TO $34 MILLION IN 1983, THUS UNDERCUTTING THE AGENCY'S ABILITY TO DEVELOP NEW POLLUTION-CONTROL TECHNOLOGY, AND ESSENTIALLY ENDING RESEARCH ON THE ECOLOGICAL EFFECTS OF ENERGY PRODUCTION--THAT IS, HOW IT AFFECTS ALL LIVING THINGS.

THE TWO ENERGY R&D PROGRAMS--BOTH OF WHICH ARE IN THE DEPARTMENT OF ENERGY--
THAT WOULD HELP MOST IN GETTING OUR SOCIETY ON THE PATH TOWARD
BENIGN AND ECONOMICAL ENERGY SOURCES--SOLAR ENERGY AND ENERGY CONSERVATION--
ARE CUT 65 PERCENT AND 76 PERCENT, ON TOP OF THE LARGE CUTS OF LAST YEAR.

IT SEEMS THAT THE PROGRAMS THAT MAKE THE MOST SENSE ENVIRONMENTALLY
AND ECONOMICALLY ARE SINGLED OUT FOR EXTINCTION.
I ASK YOU, "WHAT IS GOING ON?"

BEFORE GOING BACK TO MY RECOMMENDATION THAT YOU MEMBERS OF CONGRESS
TRIPLE THE PRESIDENT'S R&D BUDGET FOR EPA, LET'S CONSIDER A LITTLE MORE BACKGROUND
ABOUT EPA.

IN THE PAST DECADE, AS YOU WELL KNOW, THE U.S. CONGRESS
HAS PASSED A SERIES OF LAWS THAT REPRESENT ONE OF THE GREAT LEGISLATIVE ACHIEVEMENTS
OF THE 20TH CENTURY--LAWS DESIGNATED TO HALT THE DEGRADATION OF AND
IMPROVE THE QUALITY OF OUR AIR, LAND AND WATER.
THE LAWS--SUPPORTED BY A GREAT MAJORITY OF THE PEOPLE--SPEAK FOR THEMSELVES:
THE CLEAN AIR ACT, CLEAN WATER ACT, TOXIC SUBSTANCES CONTROL ACT,
SAFE DRINKING WATER ACT, RESOURCE CONSERVATION AND RECOVERY ACT,
THE SUPERFUND ACT, AND SO ON.

IT IS THE JOB OF THE ENVIRONMENTAL PROTECTION AGENCY TO EXECUTE THESE LAWS.
INSTEAD, PRESIDENT REAGAN AND ADMINISTRATOR GORSUCH SEEM BENT ON EXECUTING EPA--
AND IN SO DOING, NULLIFYING THE ENVIRONMENTAL LAWS OF THE LAND.

THOUGH EPA HAS BEEN HISTORICALLY UNDERFUNDED,
THE AGENCY HAS MADE PROGRESS NONETHELESS.
MUCH OF OUR AIR IS MORE BREATHABLE, AND SOME OF OUR WATERS MORE DRINKABLE
AND AMENABLE TO AQUATIC LIFE, THAN JUST A FEW YEARS AGO.
BUT NOW, THROUGH BUDGETARY STRANGULATION, THE ADMINISTRATION
WOULD END ANY FURTHER PROGRESS.

REMEMBER THAT WHILE MOST AGENCIES CAN DO HARM ONLY BY ACTING,
EPA CAN DO HARM BY NOT ACTING.
THE GAINS OF THE PAST DECADE WILL, IF THE BUDGET CUTS ARE APPROVED, BE THREATENED.
WITHOUT COMPETENT ENVIRONMENTAL MANAGEMENT IN THE 1980s, THE AVERAGE CITIZEN'S
EXPOSURE TO TOXICS WILL INCREASE; AIR AND WATER QUALITY WILL DETERIORATE;
ACID RAIN AND SMOG WILL INCREASE; AND VISIBILITY WILL WORSEN.

THE ASSAULT ON ENVIRONMENTAL PROGRAMS IS BEING DONE UNDER THE PRETEXT
THAT ENVIRONMENTAL REGULATIONS ARE STIFLING THE ECONOMY.
THIS ARGUMENT, AS I IMPLIED EARLIER, IS UNSUPPORTABLE.
ENVIRONMENTAL CONTROLS HAVE ADDED ONLY A FRACTION OF ONE PERCENT
TO THE ANNUAL INCREASE IN THE CONSUMER PRICE INDEX.
THE POLLUTION CONTROL INDUSTRY HAS CREATED ATTRACTIVE INVESTMENT OPPORTUNITIES
AND HAS PRODUCED FAR MORE JOBS THAN THE POLLUTION CONTROLS HAVE DISPLACED.
AND CLEARLY IT IS FAR LESS COSTLY IN TERMS OF HUMAN SICKNESS AND SUFFERING,
IN PREMATURE DEATH FROM CANCER AND RESPIRATORY DISEASES,
IN PROPERTY DAMAGED AND DESTROYED, IN WORK-HOURS LOST,
TO DEAL WITH ENVIRONMENTAL PROBLEMS HEAD-ON TODAY, RATHER THAN IGNORE OR POSTPONE
ACTION ON THEM AS THE ADMINISTRATION IS PROPOSING TO DO.

LET'S GET BACK TO MY RECOMMENDATION THAT YOU GIVE EPA MORE R&D DOLLARS.
PROBABLY THE MOST CRITICAL NEED IS TO STOP THE LOSS OF THE TALENT AND EXPERTISE
THAT HAS BEEN BUILT UP WITH GREAT DIFFICULTY OVER THE LAST TWELVE YEARS.
FOR SEVEN OF THOSE YEARS--FROM THE TIME I BECAME HEAD OF THE
PRESIDENT'S COUNCIL ON ENVIRONMENTAL QUALITY IN 1973 UNTIL THE REAGAN ADMINISTRATION
CAME IN--I WAS IN CLOSE CONTACT WITH EPA'S R&D TEAM.
I KNOW OF THEIR STRUGGLE TO RECRUIT TALENTED SCIENTISTS FROM AROUND THE COUNTRY,
GET THEIR LABORATORIES EQUIPPED AND TRAIN THIS STAFF TO BECOME
A MULTIDISCIPLINARY TEAM WORKING IN AN EXTREMELY COMPLICATED FIELD.

BY 1980 THE STAFF WAS JUST BEGINNING TO BECOME AN EFFECTIVE,
SMOOTHLY WORKING TEAM ALLIED WITH NUMEROUS UNIVERSITIES AND PRIVATE LABORATORIES
WORKING UNDER CONTRACT WITH EPA AND THEREBY PROVIDING OUR COUNTRY
WITH A NETWORK OF INSTITUTIONS CAPABLE OF COPING WITH THIS COMPLEX FIELD.
IT CONSTITUTED A MAJOR INVESTMENT FOR AMERICA--AN INVESTMENT ESSENTIAL
TO RESOLVING OUR SERIOUS ENVIRONMENTAL PROBLEMS.
NOW THE REAGAN ADMINISTRATION IS TRYING TO SCUTTLE IT.
ALREADY TOO MANY TALENTED PEOPLE HAVE BEEN LOST.
THE MORALE IS TERRIBLE.
YOU MUST NOT LET ANY MORE DESTRUCTION GO ON THERE.

IF THE REAGAN ADMINISTRATION SUCCEEDS IN ITS PLANS,
IT COULD TAKE ANOTHER DECADE TO REBUILD EPA'S R&D STAFF.
THE PENDULUM WILL CERTAINLY SWING BACK.
THE PEOPLE WILL NOT TOLERATE SUCH BACKWARD ACTION LONG.
BUT WHEN THE PENDULUM DOES SWING BACK, THE EAGERNESS TO MAKE UP FOR LOST TIME
WILL PUT US BACK WHERE WE WERE IN THE SEVENTIES WITH EPA FORCED
BY CONGRESSIONALLY MANDATED DEADLINES TO MAKE DECISIONS
WITHOUT THE SCIENTIFIC BASIS FOR DOING SO.

ONE OF THE CRITICAL NEEDS IN ENVIRONMENTAL RESEARCH AND DEVELOPMENT
IS TO HAVE A THOROUGH AND RIGOROUS MULTI-DISCIPLINARY APPROACH
TO CRITICAL ENVIRONMENTAL PROBLEMS.
FROM PERSONAL EXPERIENCE, I KNOW THAT MOST INDUSTRY R&D ORGANIZATIONS
ARE NOT SET UP TO WORK THAT WAY, PARTICULARLY WHERE THE BIOLOGICAL
AND ECOLOGICAL SCIENCES ARE INVOLVED.
WHILE UNIVERSITIES ARE SOMEWHAT BETTER IN THIS REGARD, TRUE INTEGRATION
ACROSS DISCIPLINES IN AN ACADEMIC SETTING OFTEN OCCURS ONLY IF AN OUTSIDE
FUNDING SOURCE DEMANDS IT AS A CONDITION OF SUPPORTING RESEARCH.

EPA HAS A GOOD TRACK RECORD IN THIS REGARD, BOTH IN SETTING UP APPROPRIATE TEAMS INTERNALLY AND WITH OTHER GOVERNMENT AGENCIES, AND ALSO, THROUGH ITS CONTRACTS AND GRANTS, INDUCING UNIVERSITIES TO DO THE SAME.

IN MY VIEW, ONLY EPA, OF ALL GOVERNMENT R&D ENTITIES, CAN DO THIS JOB ADEQUATELY. ONLY EPA IS CHARGED WITH LOOKING BOTH AT THE HEALTH OR ENVIRONMENTAL CONSEQUENCES OF ENVIRONMENTAL CONTAMINANTS, AND THEN, WHERE THE RISK IS WORRISOME, OF WORKING TO DESIGN WAYS TO REDUCE THE RISK THROUGH, FOR EXAMPLE, CHANGES IN INDUSTRIAL PROCESSES.

I COULD MENTION A WHOLE HOST OF EXAMPLES WHERE THIS APPROACH IS NEEDED, BUT LET ME LIST A FEW:

-- ASSESSMENT OF POTENTIAL HEALTH EFFECTS OF DIESEL EXHAUST, AND WHERE WARRANTED, TECHNICAL WORK TO MINIMIZE THE PRODUCTION OF THE THREATENING CONTAMINANTS;

-- ANALYSIS OF THE EFFECTS OF SEWAGE ON NATURAL AQUATIC SYSTEMS AND, WHERE POSSIBLE, THE USE OF NATURAL SYSTEMS AS PART OF OUR SEWAGE TREATMENT SYSTEMS;

-- MONITORING OF PATTERNS OF GROUND WATER CONTAMINATION AND, WHERE APPROPRIATE, R&D EFFORTS TO BOTH PREVENT SUCH CONTAMINATION AND MITIGATE AGAINST ITS ADVERSE CONSEQUENCES;

WE ALSO DESPERATELY NEED R&D THAT WILL LEAD TO BETTER MONITORING OF POLLUTANTS. THIS DEFICIENCY RANGES ACROSS THE BOARD, FROM CONVENTIONAL AND TRACE POLLUTANTS THROUGH BASIC DATA ON AIR, WATER AND SOIL, TO RELIABLE INFORMATION ON MANY SPECIES OF PLANTS AND ANIMALS AND THEIR HABITATS, TO THE EFFECTS OF STRESS ON ENTIRE ECOSYSTEMS.

AS FOR THE NEED FOR MORE WORK ON TOXIC SUBSTANCES,
THE NATIONAL WILDLIFE FEDERATION, IN A RECENT REPORT ON THE SHAKY STATE OF EPA,
SAID IT WELL:

"THERE ARE OVER 55,000 CHEMICAL PRODUCTS IN COMMERCE.
IN ADDITION FROM 600 TO 1000 NEW CHEMICALS WILL COME TO EPA FOR
PREMARKETING REVIEWS NEXT YEAR.
WE DON'T KNOW WHAT THE VAST MAJORITY OF THESE SUBSTANCES DO TO LIVING CREATURES.
WE DON'T KNOW WHERE THEY ENTER THE ENVIRONMENT, OR HOW THEY TRAVEL THROUGH IT,
OR WHERE THEY MAY BE ACCUMULATING.
WE DON'T KNOW HOW THEY CHANGE AFTER THEY ENTER THE ENVIRONMENT,
HOW THEY INTERACT WITH OTHER CHEMICALS, OR WHAT NEW RISKS ARE CREATED
BY THESE CHANGES AND REACTIONS."

THE TOXIC SUBSTANCES CONTROL ACT WAS PASSED BY CONGRESS IN 1976
TO SCREEN TOXIC FROM NON-TOXIC CHEMICALS AND TO PROTECT THE PUBLIC
FROM THOSE CHEMICALS FOUND TO ENDANGER PUBLIC HEALTH.
IF THIS LAW IS GOING TO WORK, MORE R&D, NOT LESS, IS NEEDED.
WE DON'T KNOW THE FATE OR EFFECT OF THESE MATERIALS.
IN FACT, WE DON'T EVEN HAVE GOOD, RELIABLE, INEXPENSIVE MONITORING TECHNIQUES
FOR MANY OF THEM.

IF ANYTHING, RESEARCH AND DEVELOPMENT NEEDS ARE EVEN MORE CRITICAL
IN THE AREA OF HAZARDOUS WASTES.
HERE THE PROBLEMS OF MONITORING, MULTIPLE EXPOSURE AND RISK ASSESSMENT ARE COMPOUNDED.
AND R&D EFFORTS IN MITIGATION AND CLEAN-UP ARE AT A PRIMITIVE STAGE TECHNICALLY.
WE ARE TRYING TO DEAL WITH 20TH CENTURY PROBLEMS USING 19TH CENTURY TECHNIQUES--
DUMPING OUR WASTES INTO OUR AIR, WATER OR LAND.

CONSIDER THE DIMENSIONS OF THE PROBLEM:

77 BILLION POUNDS OF HAZARDOUS WASTES ARE PRODUCED IN THE U.S. EACH YEAR,
ABOUT ONE POUND PER PERSON PER DAY...ONE TEN-THOUSANDTH OF A POUND
OF MANY OF THESE SUBSTANCES CAN HAVE TOXIC EFFECTS ON HUMAN BEINGS,
ON WILDLIFE AND ON PLANT LIFE...AT LEAST 7,200 DANGEROUS, OR POTENTIALLY DANGEROUS,
CHEMICAL DUMPS HAVE BEEN IDENTIFIED--AN AVERAGE OF 17 FOR EACH CONGRESSIONAL DISTRICT..
SOME 90 PERCENT OF TOXIC WASTES ARE BEING DISPOSED OF IN AN ENVIRONMENTALLY
UNSOUND MANNER--IN UNSECURED LANDFILLS, THROUGH IMPROPER BURNING,
OR BY ILLEGAL "MIDNIGHT DUMPING."

THE SURGEON GENERAL HAS REPORTED THAT TOXIC WASTES POSE ONE OF THE GREAT
THREATS TO THE HEALTH OF AMERICAN CITIZENS IN THE 1980s.

WE NEED TO LOOK AT THE CORE PROCESSES--AT THE INDUSTRIAL,
TRANSPORTATION, COMMERCIAL AND RESIDENTIAL ACTIVITIES OF OUR NATION AND,
THROUGH RESEARCH AND DEVELOPMENT, LEARN HOW TO MEET OUR NEEDS
WITH LOWER POLLUTION RELEASES AND LESS ENVIRONMENTAL DEGRADATION.
WE NEED TO TURN WASTES INTO USEFUL PRODUCTS AND GET MORE USE FROM OUR MATERIALS
BEFORE THEY BECOME WASTES.
IN SHORT, WE NEED TO LOOK AT PRODUCT AND PROCESS WASTE IN THE SAME WAY
WE LOOK AT ENERGY, AND FIND THE TRUE "CONSERVATIVE" APPROACH.
THE PROBLEMS OF HAZARDOUS WASTES ARE ACCELERATING.
YET THE ADMINISTRATION HAS BUDGETED NO MORE R&D MONEY FOR THIS PURPOSE
THAN IT DID LAST YEAR, AND THE BUDGET FOR TOXIC SUBSTANCES HAS BEEN SHARPLY REDUCED.

WE KNOW VERY LITTLE ABOUT THE IMPACT OF POLLUTANTS ON PLANT LIFE,
BUT THE EVIDENCE INDICATES IT COULD BE HIGH.
FOR EXAMPLE, THE NATIONAL CROP LOSS ASSESSMENT JUST COMPLETED BY EPA
SHOWS THAT THE LOSS FOR JUST FOUR CROPS FROM JUST ONE FORM OF AIR POLLUTION--
OZONE--AMOUNTS TO $3 BILLION ANNUALLY.

YET EPA'S AIR POLLUTION RESEARCH, WHICH INCLUDES THE STUDY THAT UNCOVERED THE OZONE LOSSES, WOULD BE CUT BY $23 MILLION--MORE THAN ONE-THIRD ITS 1981 LEVEL.

AS THE WASHINGTON POST NOTED YESTERDAY IN AN EDITORIAL, THE CROP LOSS ASSESSMENT'S FINDINGS ARE JUST ONE ILLUSTRATION OF WHY WE NEED TO BETTER UNDERSTAND THE EXTENT, SOURCES AND EFFECTS OF POLLUTION, AND THE DIFFERENT METHODS OF CONTROLLING IT.

THEN THERE IS THE MATTER OF GROUNDWATER--THE DRINKING WATER SUPPLY FOR ABOUT HALF OF THE PEOPLE IN THIS COUNTRY.
GROUNDWATER IS PARTICULARLY SUSCEPTIBLE TO CONTAMINATION FROM TOXIC WASTES.
MANY WATER SUPPLIES HAVE ALREADY BEEN DEGRADED BY ORGANIC CHEMICALS SUCH AS HALOGENATED HYDROCARBONS, AND BY HEAVY METALS SUCH AS CHROMIUM.
MANY MORE SOURCES OF DRINKING WATER ARE CURRENTLY THREATENED AS TOXIC WASTES SEEP TOWARD THEM.

THE CONTAMINATION OF THE NATION'S DRINKING WATER IS A SERIOUS AND GROWING PROBLEM.
IT MAY ALSO BE AN IRREVERSIBLE PROBLEM; ONCE OUR UNDERGROUND RESERVOIRS BECOME CONTAMINATED, THEY WILL STAY THAT WAY FOR A VERY LONG TIME.
TO SOLVE THIS PROBLEM WE MUST BETTER UNDERSTAND IT.
IGNORING THIS NEED, THE ADMINISTRATION IS PROPOSING SUBSTANTIAL CUTS IN AN ALREADY INADEQUATE R&D EFFORT.

THE MOST SERIOUS TOXIC WASTE PROBLEM OF THEM ALL, RADIOACTIVE WASTE, WORSENS DAILY WITH NO SIGNIFICANT COMMITMENT TO DEAL WITH IT.
THE PROBLEM IS SO BIG THAT CONGRESS HAS DECIDED TO EXCLUDE IT BY DEFINITION AS A "TOXIC WASTE".

AS THE U.S. COMPTROLLER GENERAL HAS POINTED OUT, THE FEDERAL GOVERNMENT HAS NEVER ARTICULATED A FIRM POLICY ON HOW IT INTENDS TO MANAGE, OVER THE LONG TERM, EITHER FEDERAL OR COMMERCIAL NUCLEAR WASTE.

WHAT BETTER AGENCY TO STUDY THE HEALTH AND ENVIRONMENTAL IMPLICATIONS OF RADIOACTIVE WASTE THAN THE ENVIRONMENTAL PROTECTION AGENCY?
THE INSIGNIFICANT $2.5 MILLION BUDGETED IN 1982 FOR RADIATION RESEARCH IS BEING REDUCED TO $1.6 MILLION IN 1983.

THE DECISION IN 1975 TO TAKE THE PRIME RESPONSIBILITY FOR PROTECTION AGAINST NUCLEAR POLLUTANTS OUT OF EPA AND TRANSFER IT TO A PRODUCER OF NUCLEAR WASTE--ERDA--SHOULD NOW BE REVERSED.
THE PRESIDENT'S PLAN TO GET RID OF THE DEPARTMENT OF ENERGY SHOULD FACILITATE SUCH A CORRECTION.

EPA IS RESPONSIBLE FOR PRODUCING GUIDELINES FOR THE NUCLEAR REGULATORY COMMISSION DEALING WITH DISPOSAL OF RADIOACTIVE WASTE.
THE GUIDELINES WERE DUE FOUR YEARS AGO.
I KNOW THAT THE REASON FOR THE DELAY IS THAT EPA WAS NEVER GIVEN THE EXPERTISE TO DO THE JOB.
THE LATEST WORD IS THAT THESE GUIDELINES WILL BE READY THIS SPRING. MAYBE.

THE CUTS IN AIR-QUALITY R&D ARE ALSO OUTLANDISH.
RESEARCH PROVIDES THE BASIS ON WHICH ALL OTHER CRUCIAL ENVIRONMENTAL-PROTECTION DECISIONS ARE MADE.
IF WE DO NOT KNOW THE EFFECTS OF VARIOUS AUTO AND INDUSTRIAL EMISSIONS IN THE ATMOSPHERE, WE WILL NOT BE ABLE TO DEVELOP THE CONTROLS NECESSARY TO PROTECT THE POPULATION FROM SERIOUS HEALTH HAZARDS.
YET ALL EPIDEMIOLOGY STUDIES TO DETERMINE THE CHRONIC AND SHORT-TERM EFFECTS OF VARIOUS SUSPECTED POLLUTANTS ARE BEING OR HAVE BEEN ELIMINATED.

RESEARCH ON THE EFFECTS OF AUTO EMISSIONS IS BEING HALTED AT THE SAME TIME
THAT DIESEL CARS WITH A WHOLE NEW SET OF EMISSION PROBLEMS
ARE BEING INCREASINGLY USED.

SULFUR DIOXIDE AND NITROGEN OXIDE EMISSIONS ARE DAMAGING HUMAN HEALTH,
DESTROYING PROPERTY, AND KILLING FISH LIFE IN INCREASING NUMBERS OF LAKES AND PONDS
IN THIS COUNTRY, IN CANADA, AND THROUGHOUT MUCH OF THE WORLD.
WE NEED R&D WORK ON ADVANCED SYSTEMS FOR SCRUBBING $SO_2$.
WE NEED TO CONTINUE THE DEVELOPMENT OF A BURNER THAT REDUCES BOTH $SO_2$ AND $NO_x$
EMISSIONS IN COAL COMBUSTION--A PROMISING PROJECT THAT CAN CUT COSTS MARKEDLY
FOR UTILITIES, BUT IS NOW LANGUISHING FOR LACK OF FUNDS.
THE GERMANS AND JAPANESE ARE MAKING A MAJOR PUSH TO DEVELOP EQUIPMENT
FOR EFFECTIVE POLLUTION CONTROLS.
THEY RECOGNIZE THE VAST AND PROFITABLE MARKET FOR THEM--
JUST AS THEY DID FOR THE SMALL CAR.
THEY WILL LIKELY TAKE THIS MARKET POTENTIAL AWAY FROM US,
INCREASING JOBS AND EARNINGS IN JAPAN.

AT ONE TIME WE WERE THE ACKNOWLEDGED LEADER IN THE WORLD
IN DEVELOPING TECHNOLOGY TO PROTECT THE ENVIRONMENT.
TODAY THE WHOLE DEVELOPED WORLD IS MOVING AHEAD AGGRESSIVELY IN THIS FIELD
WHILE WE RETROGRESS.

IF APPROVED, THE ADMINISTRATION'S CUTS IN RESEARCH AND DEVELOPMENT
WILL UNDERMINE THE CREDIBILITY AND EFFECTIVENESS OF EPA FOR YEARS TO COME.
THE CHANGE IN EMPHASIS IN EPA RESEARCH IS EQUALLY TROUBLESOME.
WHAT LITTLE RESEARCH IS TO BE CONDUCTED WILL HENCEFORTH--IF NEW EPA MANAGEMENT
HAS ITS WAY--BE DIRECTED ONLY TOWARD MEETING EPA'S IMMEDIATE REGULATORY NEEDS.
RESEARCH NOT IMMEDIATELY USEFUL IS TO BE ELIMINATED.

AS GEORGE BROWN AND RADFORD BYERLY NOTED IN THEIR EXCELLENT ARTICLE IN SCIENCE MAGAZINE: "ONE KIND OF RESEARCH CAN PROVIDE INCREMENTAL INFORMATION TO MEET A DEADLINE; ANOTHER KIND WOULD BETTER ADDRESS THE CONTINUING NEED." IF RESEARCH ADDRESSES ONLY THE SO-CALLED IMMEDIATE NEEDS, EPA'S OFFICE OF RESEARCH AND DEVELOPMENT WILL NOT BE ABLE TO ACHIEVE THE UNDERSTANDING THE AGENCY NEEDS.

"FIRST ULTIMATE GOALS AND THEN SPECIFIC OBJECTIVES MUST BE SET," THE AUTHORS NOTE. "THE CLEAN AIR ACT, FOR EXAMPLE, REQUIRES STATES TO DEVELOP IMPLEMENTATION PLANS, AND THIS LEADS IN A FAIRLY STRAIGHTFORWARD WAY TO SPECIFIC RESEARCH OBJECTIVES.
THUS AN IMPLEMENTATION PLAN FOR PHOTOCHEMICAL OXIDANTS REQUIRES AN ATMOSPHERIC CHEMISTRY MODEL.
BECAUSE MANY UNIQUE LOCAL AIRSHEDS MUST BE CONTROLLED, WHAT IS NEEDED IS A THOROUGH UNDERSTANDING OF PHOTOCHEMISTRY; THIS IS THE PROPER RESEARCH OBJECTIVE, AND IT IS THE INTELLECTUAL CAPITAL NEEDED FOR ACHIEVING THE ULTIMATE ABATEMENT GOAL."

EPA'S RESEARCH AND DEVELOPMENT BUDGET MUST NOT BE CUT FROM $278 MILLION THIS YEAR TO $216 MILLION IN FISCAL 1983, AS THE REAGAN ADMINISTRATION PROPOSES.
AT A TIME WHEN EPA'S RESPONSIBILITIES ARE MULTIPLYING, WHEN POPULATION AND INDUSTRIAL GROWTH ARE PUTTING INCREASING STRESS ON OUR ENVIRONMENT, THE AGENCY'S R&D BUDGET MUST KEEP PACE.
FOR EPA TO DO ITS CONGRESSIONALLY MANDATED JOB, TO CONTINUE THE NATIONWIDE ENVIRONMENTAL CLEAN-UP THAT IT STARTED OUT TO DO, TO SAFEGUARD THE NATION'S INVESTMENT IN ITS TALENTED R&D STAFF, THE PRESIDENT'S PROPOSED R&D BUDGET SHOULD BE TRIPLED, i.e. RAISED TO $650 MILLION.

THIS COMPARES WITH A BUDGET OF $525 MILLION (1983 dollars) BACK IN 1979, WHEN EPA's CONGRESSIONALLY MANDATED ASSIGNMENT WAS MUCH LESS.

AS I STATED EARLIER, THE IMPACT OF THIS CHANGE ON THE PRESIDENT'S TOTAL BUDGET COULD BE BALANCED BY DELETING ONE B-1 BOMBER.

THE SUBJECT ON YOUR AGENDA TODAY CAN BE BOILED DOWN TO TWO SIMPLE QUESTIONS:

WILL WE LEAVE FUTURE GENERATIONS A POISONED, WASTED EARTH AS THE LEGACY OF THIS GENERATION'S SHORTSIGHTEDNESS?

OR WILL WE PASS ON TO THEM A BOUNTIFUL, BEAUTIFUL, UNCONTAMINATED EARTH, THE LASTING RETURN FROM THE WISE INVESTMENTS OF TODAY?

I HOPE AND TRUST YOU WILL KEEP OUR COUNTRY ON THE LIFE-SUPPORTING PATH BY GIVING THE ENVIRONMENTAL PROTECTION AGENCY THE FUNDS IT NEEDS TO DO THE JOB YOU CREATED IT TO DO--AND THEN SEEING TO IT THAT THE REAGAN ADMINISTRATION PROPERLY FULFILLS THIS MANDATE.

# # #

Mr. SCHEUER. Thank you very much for a very thoughtful and stimulating testimony.

I am going to defer my questions now.

Congressman Brown of California?

Mr. BROWN. I want to thank you, also, Dr. Peterson for your excellent testimony.

I'm somewhat at a loss to know what kind of a strategy those of us who agree with you with regard to the inadequacy of the budget should take, considering the budget pressures we face.

If we could have a straightforward up or down vote on cutting one B-1 bomber and adding money for EPA, we might win it. I don't know any way to do that.

Do you have any suggestion for a strategy that we might pursue, those of us who agree with you in achieving these goals?

Dr. PETERSON. Well, I would think that if many of you Members of Congress, in some organized fashion, would make it clear to the people of the country the critical importance of this need for R. & D. dollars—how it relates to their strong interest in protecting the air they breath, the water they drink, the land where they grow their food—that you could get the support of the Congress. The President comes in here with his large budget for military, this huge increase, and that proposal gets accepted by all of you.

It would seem to me that this piddling, relatively speaking, increase for EPA research with the right kind of articulation and forceful delivery and bulldogging effort of many of you in Congress, could pass the Congress.

Mr. BROWN. Do you think the recent revelation of the large and still growing losses due to pollution on vital industries such as agriculture may help to influence more people to respond favorably to improving our pollution research and control programs of all kinds?

Dr. PETERSON. Yes. I would think so, definitely. The data that I just mentioned that received publicity recently, about ozone impacting on four crops, could be very meaningful to the agricultural community. In fact, I believe that the farmers are more knowledgeable about many of these things than most of us. They are out there running their own businesses and they see many things impacting on their crops. If they had evidence that some of these things are also having an impact on their earnings, they could provide some pressure.

The business community is going to pay a major penalty, I think, for what is going on in the Reagan administration.

When this pendulum is turned around, as it certainly will be, the people are going to be angry, and they are going to be blaming business for it. Some members of business, some trade associations, are cheering events going on in EPA. But most of them are. Most of the responsible members of the industrial community recognize that a proper EPA is fundamental to their best interests.

And if they see that EPA is crippled so it can't issue permits, can't make things happen as is now occurring, they are the ones that are going to be in deep trouble. It is going to hurt our economy. This false contention that EPA regulations hurt our economy—I cannot understand why that persists, because the facts never have supported it and they don't today.

I have never seen anybody come in with data to show that the Clean Air Act hurt our economy. It has done exactly the opposite. It has produced a new market. Our free enterprise system has gone to work and produced new products and sold them. Many jobs have been created.

And, as I said, in my prepared remarks, we produced a very successful industry to make cool air to make us more comfortable—the air-conditioning industry, which made many thousands of jobs and good earnings for business. And now we are making clean air to make us more healthy, and some people scream there is something wrong with that.

If we want to improve our economy, we ought to be going to work on some of these new markets.

Why the Congress can't get behind it and can't work in partnership with business and with agriculture, as you on this committee want, is surprising to me.

And, don't let anybody come in and tell you without your challenging them that these regulations hurt our economy. Ask them for their data. They don't have any data. The data say the opposite.

Mr. BROWN. One last question, Dr. Peterson. As the former Governor of a great State as well as the director of major research programs, do you think that there is any realistic hope that State government or private research will be able to make up for the loss in the EPA research and development budget?

Dr. PETERSON. No; I don't think there is any chance of that happening.

When I was Governor of Delaware, being the only Governor with technical training, others would talk to me about science advisers and so on. My science adviser was Hurt Worthington—he used to be head of the Advisory Committee for the Nuclear Regulatory Commission, and so on. But, the States had almost nobody, really, involved in advising them in the science area. They were so wrapped up in so many other near-term problems, they couldn't spend much time thinking about long-term problems.

In a question of research, you have got to be thinking about long-term problems.

Three different organizations—consultants in the environmental area—told me that this past year their business with industry has fallen off. And they surmise that that's because business don't need to worry about enviromental protection now. But, it is a fact that business has fallen off.

Now, I don't think that the Government getting out of this will help, that the States or private sector will take over. I do think that a well-managed organization in R. & D. in EPA, as it was getting to be about 1980 with a lot of good talents, working closely with universities and the business sector—in fact, we have to work with the business sector and with universities in my judgment—working together in a good partnership, will provide the tools to make headway in this area.

What is going on now is a giant step in just the opposite direction. We have to reverse direction so that we can continue building these many centers of excellence in industry and in universities, as well as in Government.

Something that involves the health of the people requires Government involvement.

Some time ago I was on a "Time to Choose," TV series with Milton Friedman. I was on the first segment of that series with him, and we had a little debate about regulations. One thing he agreed on was that when it came to protecting the air and the water and the land, you had to have Government regulation. The free market couldn't cope with that.

Here you have the greatest champion of a free market saying that. In fact, the people couldn't buy clean air in the marketplace like they could buy cool air in the marketplace. So, they bought it at the polling place and they got their Members of Congress to vote unanimously for the Clean Air Act.

That act, you will remember, called for regulations to clean up automobile exhausts by a given date. And out of that came a major business—catalytic converters.

Mr. BROWN. Thank you very much.

Mr. SCHEUER. Congressman Carney, the distinguished ranking minority member of our committee?

Mr. CARNEY. I would just like to thank Dr. Peterson for being here today. I would also like to tell my colleague from California—he asked Mr. Peterson how can we do such things as pursue the direction that we would like—I think that we can.

Yesterday, we had hearings on weather stations—the closing of 45 weather stations. I contacted the Department of Commerce and today we are announcing that they are not going to close the 45 weather stations. They are going to keep 25 full-time open and 20 part-time open around the Nation. For $2.9 million, we will keep 163 employees on the Federal payrolls. I might add that includes JFK, seven employees, $90,000 and LaGuardia, seven employees, $157,000 and that means a lot to us in New York, and the chairman should be pleased with that.

But, we have to look at everything. We see something that was wrong and we bring it to their attention and maybe we will correct it.

Now you say, Dr. Peterson, that we should raise the amount of money to $650 million. That's fine. Do you have any areas of concern where you think this should be and do you have justification for that? Or, is it just the fact that you looked at the 1977 budget and took the real term dollars in 1983 and said we should maintain that level?

For us to say we have to go to $650 million, why don't we say we have to go to $950 million, or why not $450 million? Do you have a direction or plan for $650 million as to what line items you would want in and what justifications and such?

Dr. PETERSON. I certainly haven't developed a line-item budget. I have been communicating with many people who have been deeply involved with EPA and who are involved today, people who have the scientific training and who have been effective in research in the past.

This level of funding would be a conservative level to build an effective multidisciplinary force at EPA. The specific assignments are of less importance at this juncture than maintaining that staff which can work on many things over the years to come.

What I would recommend to your committee, to answer your question—rather than having an off-the-top-of-a-head kind of response from me—would be for you to consult with a half a dozen people from around the country who are real experts, people who have been involved in research. Present EPA management cannot possibly do what I am talking about. They don't have the background or the understanding to do it.

These would be people who could prepare for you their list of how the money should be utilized given the freedom to do it.

I have asked that question of many people. I have had many, many hour-long telephone conversations in the last week since I knew I was coming here with people who have been involved in this area. I asked each one for his or her suggestions—where would you put the money?

One of the things which they are deeply concerned about is the lack of understanding of the impacts of the various pollutants on life—plant and animal life. What is going on? How do pollutants move from the air through an animal or to the human body or to a plant?

Are they modified rapidly or do they persist for long periods of time? What kind of negative impacts do they have? We have so little knowledge of that and it is a difficult area to work with.

I believe we would need a very considered analysis of the problem in order to come up with a meaningful answer to your question. I am not prepared to do that.

I have a number of items that I could go through and list for you, but——

Mr. CARNEY. I appreciate that, sir. That's not your job. You are here as a witness and we are very appreciative of the fact that you came here.

But, you did use a figure and I was just curious as to how you got to that figure.

From what I got out of your testimony, it seems that you took that 1977 baseline figure and you added inflation and tried to bring it to real dollars in 1983. Under short notice to come before this committee, I could fully understand, and I fully understand your saying that it is one B–1 bomber.

But the most expensive number I ever heard for a B–1 bomber was $230 million. So, that would be three B–1 bombers. That is not even worth arguing here today.

Dr. PETERSON. This is the number we attained from the General Accounting Office about 3 days ago.

Mr. CARNEY. $650 million?

Dr. PETERSON. No. $450 million. This is the incremental amount.

Mr. CARNEY. As I say, that is not worth arguing. But, I have never heard a figure that high for a B–1 bomber. I have heard of them from $130 million to $230 million——

Dr. PETERSON. I think you will find that's the figure now.

Mr. CARNEY. My colleague tells me to wait until next week. I guess it goes up by hundreds of millions a week.

On that premise, it might be up to $950 million for R. & D.

Dr. PETERSON. What I am trying to do with that comparsion is just to emphasize that we have this fantastic increase in military,

where the increase in the R. & D. budget in the Department of Defense is seventeen times the total R. & D. budget of EPA.

I am just trying to pose the question, in the judgment of our leaders of our country, is that really the right priority, to put that tremendous amount in R. & D. for the military and cut it in environmental agencies. All this money for furthering death, and cutting out work to provide life.

Mr. CARNEY. I wouldn't say furthering death. I would say enhancing our abilities to maintain peace and life on this Earth. That's how I would look at it.

But that is not the argument at hand, I don't think. But I was just curious. I didn't know a B–1 bomber was that expensive from all the information I have received. I just thought I would point that out.

You have been involved in R. & D. You have been a leader of the industry, the chemical industry. You have been involved in more things than probably anybody in this room. You have an incredible life. I'm amazed every time you come in and the chairman reads your biography. I don't know how you have ever accomplished what you have in your lifetime.

Dr. PETERSON. I am 65 years old.

Mr. CARNEY. And, you don't even look that. You have managed to stay young, too. That's great. I guess it's keeping busy that does it.

But, R. & D. is a very difficult thing to understand, I think. You have a program. We have a concern and we are trying to find a good data base for identifying levels of contamination, identifying ways of removing contamination, remedial action or identifying ways of preventing it.

There comes a time when you do R. & D. on some programs that they would be zeroed out. Do you agree?

Dr. PETERSON. Yes. Absolutely. When I used to run a large research division, they were doing it every year. You have highly creative people that have hundreds of ideas—many, many more than you can possibly work on within the limits of your budget. So, every year, you are analyzing which ones are you going to spend your money on. All those below the line have to wait until some other day.

It is the same way in EPA. That's why I say let's get some people in who have the imagination to define the best and most needed projects and see how much of that you can do for $650 million.

Mr. CARNEY. What you are saying, then, is that EPA should always be in the R. & D. business, just continue? We go on and on forever? We create projects forever and go on and on, that this is a true Government role—just to keep that bureaucracy steamrolling, whether we need an answer to a problem or not?

I am not saying we have solved our problems, but when we do solve our problems, and hopefully very soon in an area, say, of clean water——

Dr. PETERSON. We could go on forever. Yes.

Mr. CARNEY. You go on and on forever?

Dr. PETERSON. Just like I think industry will continue their bureaucracy in their research area forever.

Mr. CARNEY. That's the point that I am trying to make. I think we might want to have a point in time where we want to take that effort and put it into industry.

I have just been notified that my time is up. I just want to say that you mentioned Germany and Japan. My question is, in that area where you said that they are going in and they are building the industry, who is it in Germany and Japan that is going in and building the industries? Is it the government? Is it their EPA? Or, is it the large Japanese corporations, the multinational corporations, who see a future in this and who see a profit in this and who see an opportunity to get into an area that's going to expand in leaps and bounds?

Dr. PETERSON. In Japan, it is government, universities, and industry working together.

I was head of the U.S. Environmental Mission to Japan when I headed CEQ. They would come here 1 year, we would go there the next. The Minister of Environment there was Miki, who later became the Prime Minister.

We traveled all over Japan. The government was obviously the strong leader. But they had a cooperative venture with industry and universities. And they took this thing seriously. They were in more trouble than we were because of air and water pollution.

But they went ahead and went to work on it. They weren't doing all the complaining like we do here. We had a press conference in Tokyo one day. A reporter from the Los Angeles Times said to Miki and me, sitting up there, "which of these two countries are going to fulfill the Muskie standards first,"—the Muskie standards for automobile exhausts.

And, Miki said, "Japan."

I didn't argue with him, because it was obvious to me that they were going to be way ahead of us. They were going ahead and doing it, while we were over here arguing about whether it merited doing or not.

And then, they did go ahead and do it. They design good cars, and they sell their cars. They haven't complained about our laws, have they? They just take the market away from us.

Mr. CARNEY. But they just transfer it into industry. That is the point that I am trying to bring out. And that is, perhaps, where our biggest bottleneck is right now, our ability to transfer these technologies into industry and have industry make profits from them and have them marketed where it makes sense to the polluters to use them. I think this is an area we have to look into.

To continue to run R. & D. programs, to me—particularly when you look at EPA's track record for the last 10 years in many of their programs—they haven't accomplished anything. They haven't set baseline data on anything, really.

Dr. PETERSON. They have accomplished a lot. But, relative to what needs to be done, they have accomplished a very small amount.

Mr. CARNEY. With all the money that they have had, I don't think they have accomplished much. But, we are not going to argue. My time is up and I yield back to the Chair.

Mr. SCHEUER. Thank you very much, Congressman.

Congressman Doug Walgren of Pennsylvania?

Mr. WALGREN. Thank you, Mr. Chairman.

When you look at the EPA research and where we are in the environmental problem, isn't it fair to say that the particular focused unmet need in research outstrips the present budget completely?

Dr. PETERSON. Absolutely.

Mr. WALGREN. In fact, EPA has not done what the Congress asked it to do because it did not, in many instances, have the scientific bases on which to base a regulation? So, it is the research function that has essentially held them up from establishing baselines in these many pollutants that they have been mandated to do by the Congress?

Dr. PETERSON. Yes, sir.

Mr. WALGREN. And it is also true that the gravest problem on an overall basis is acid rain in terms of a large ecological impact. And we are being told time and again that we do not have enough knowledge to address the gravest general threat to our ecological sphere.

So, a reasonable person would not expect that EPA would have any trouble using these moneys wisely for critical needs, would they?

Dr. PETERSON. I would think the opportunity to invest money in this area is way beyond the $650 million I am talking about. The big question is which of the many areas will we work on within the dollar limits.

There are always limits, no matter how big the country is or how big the industry is. If you have the tremendous assignment that EPA has, as you pointed out, the number of things to work on are way beyond what they can possibly work on.

Russ Train used to be head of EPA when I was head of CEQ. We had many, many sessions together. I used to feel sorry for him. What you people in Congress had told him to do the EPA couldn't possibly do properly. They didn't have the data.

And they were struggling. They hired people to do the job. That's why I get so upset when, after about 10 years, they had a good nucleus staff of experts. And they were able to work in a multidisciplinary way. In other words, physicists and chemists and biologists and engineers, all pulling together beginning to understand this complex network of problems. This takes some time. And they had reached that point.

Now we are throwing it down the drain.

Mr. WALGREN. Isn't our real problem that we are trying to get our political system to react intelligently to the need for change?

We are so quick to support the status quo. Of course, we all would want those weather stations to stay in place. But, our support for them really is because we want the status quo to stay, not because we make a careful assessment of the need for a certain number of weather stations spread at certain places around the country.

The political system supports the status quo. Our problem here is that we can't intelligently address change.

Dr. PETERSON. There is always a problem of coping with the future. Having been so deeply involved with research in a very successful company that involved research, I know it is fundamental that the management have an appreciation of research and be com-

fortable talking to people who are working out on the frontier of knowledge, which is also the frontier of ignorance.

As our knowledge expands to a greater and greater sphere, we also have a greater area of ignorance out there.

That's going on in research all the time. If management doesn't feel comfortable or understand that, they cut out long-range thinking. And that's what is happening in EPA now. They are interested in the very near-term results, but have little interest in the longer term.

Mr. WALGREN. Our political powers that be in this area, at least in terms of our industry, are clearly uncomfortable with change in the area of EPA.

Dr. PETERSON. Now, one thing I should emphasize, I think, is that we were making good headway in our country in getting industry and EPA and other groups to pull together in this problem. There is still a lot of complaining and so on, but for the most part they are beginning to work together.

I'm afraid that that whole collaborative effort is being set back, now.

Mr. WALGREN. Thank you, Mr. Chairman.

Mr. SCHEUER. Our distinguished colleague from the State of Rhode Island, Claudine Schneider.

Mrs. SCHNEIDER. Thank you very much.

Despite the fact that this is a very interesting and stimulating conversation, I will not contribute all of the thoughts that I have on it, but rather would like to ask you just for two specific aids.

One, in the beginning of your testimony, you had indicated that the American people do not support the actions that are taking place in the Environmental Protection Agency, vis-a-vis their high level of support for environmental protection.

I am familiar with the Gallup poll, but I was wondering if you have other resources, if there have been other polls that have been funneled to you that you could perhaps share with this committee?

Dr. PETERSON. Of course, there is the Harris poll. And, we have many polls that environmental groups have run. They all say the same thing.

But I don't know of any poll which would say that the people of the country were overwhelmingly concerned about EPA. I don't think they have been informed about that yet. And it is important that we get the people of the country informed about what is going on at EPA.

We are going to do our darndest to make that happen. I think when they do get informed about it, in light of their tremendous interest in protecting the air, water, and land that they are going to raise hell about it.

Mr. SCHEUER. Will my colleague yield, briefly?

Mrs. SCHNEIDER. Yes.

Mr. SCHEUER. A couple of years ago, we had an enormous effort, we put together a consortium of environment groups and natural resource groups and park groups in connection with the Alaska land legislation. That was done, as I recall, by Congressman Mo Udall, Congressman John Seiberling, Congressman George Brown, and others. It was a historic undertaking.

I don't think when we started that effort that anybody gave that legislation a snowball's chance in hell.

We developed one hell of a head of steam, and in the end we not only won—we thought it might be a squeaker—but we won with a tremendous margin.

I think maybe we ought to try and put that consortium together, that phalanx, that broad phalanx of good Government groups concerned about our health, our environment, our recreation, and the future of the planet. Let's get them engaged and committed.

I yield the time back to Mrs. Schneider.

Mrs. SCHNEIDER. I suppose that what I would request would be better off the record rather than on the record, but I would be interested in knowing some of the different industries that share your concern for the apparent removal of EPA activity in the area of research.

I have had communications with a number of different industries, and they say that they are not going to be able to afford, nor have the sophistication, to carry on some of the industry research.

I wonder if you might be able to convey to us some of the industries that you may know of that are also of that opinion.

Dr. PETERSON. I prefer not, if I may.

Mrs. SCHNEIDER. All right. We will let that pass, then.

Dr. PETERSON. I will be glad to talk to you about that later.

Mrs. SCHNEIDER. Thank you, Mr. Chairman.

Mr. SCHEUER. One last question before we move on to the next panel.

We have heard from you about the inadequacies of EPA and the lack of the fundamental structural legislation that gives them a mission that we can hold them up to. We have heard people suggesting that we make EPA an independent regulatory agency, perhaps like the Consumer Product Safety Commission.

What would your reaction be to this kind of a suggestion as a way to make EPA more objective and more effective and a good deal more independent of whoever the occupant happens to be down at 1600 Pennsylvania Avenue?

Dr. PETERSON. I think that would be a major step forward. I would strongly recommend it.

The political pressures that are continually brought up against a regulatory agency are undoubtedly brought to bear more in a line organization unit than they would be in an independent regulatory group.

Furthermore, if we are going to have some respect for the staff, for a talented, well-trained staff of experts dedicated to this field, we cannot afford to have it go through these wild swings like is happening right now. If you had an independent agency, maybe patterned after the original plan for OTA which got messed up on the floor of the House. There was going to be a board dominated by outsiders, but it had two Members of the House and two of the Senate plus seven outsiders that were going to run that office. The chairman of it was an outsider, outside of Congress.

You could have something like that which would maybe be tied into the Government but which would really be dominated by people who had the experience and the vision to run a major research enterprise.

Mr. SCHEUER. I have several other questions. I'm sure some of my colleagues do also. I'm going to ask unanimous consent that we may be permitted to submit them to you in writing, Dr. Peterson, since time is getting short.

I want to thank you for your predictably stimulating and thoughtful testimony. We are all very grateful to you.

Dr. PETERSON. Thank you for inviting me.

Mr. SCHEUER. I would ask Congressman Walgren to introduce the next panel and to chair the session as I have to be gone for a short while.

Mr. WALGREN. I would like to make a panel out of the remaining witnesses: Dr. Richard Dowd of Environmental Research and Technology Inc.; Dr. Lester Lave, Brookings Institute; Dr. J. William Haun, chairman of the National Association of Manufacturers Committee on Environmental Quality; and Dr. Julius Johnson of Dow Chemical Co.

Your written statements will be made automatically part of the record at this point. If you could summarize instead of reading lengthy statements, that would be helpful.

We will have all of the presentations by the panel at this point and then we will come back and talk among ourselves at the end.

Our effort is to get the most effective communication between us as we can and the best record for work by other members as we can. So, please feel free to communicate to us in whatever way you feel is most effective.

Let me start, then, with Dr. Dowd. If I could suggest, perhaps, 10 minutes or something like that as a general framework for us to work with, I think we can do this effectively.

Dr. Dowd?

## STATEMENT OF RICHARD M. DOWD, PH. D., ENVIRONMENTAL RESEARCH & TECHNOLOGY, INC.

Dr. DOWD. Thank you very much, Mr. Chairman. I am very happy to be here to speak with you this afternoon.

My name is Richard Dowd. I served as Acting Assistant Administrator for Research in EPA from November 1980 until June 1981. In addition, I was the Executive Director of the Science Advisory Board and the Science Policy Adviser to the Administrator from 1977 through 1981.

I am now employed as an environmental consultant in the private sector. My testimony reflects my professional judgment on these issues.

I would like to address the questions of priorities in research and the level of support for research within EPA and the use of the Science Advisory Board, as the chairman requested in his letter.

I concur with the statements of Mrs. Gorsuch and Dr. Hernandez to the effect that the quality of EPA science must be very high and that the research program should be focused "to emphasize results which relate directly to the Agency's regulatory programs and the country's most pressing environmental needs."

However, I am concerned that many of the specific reductions in the proposed budget may, in fact, undercut those regulatory programs and leave the Congress and the Agency in a position of not

having enough information on which to base good decisions in the future.

I plan first to discuss personnel reductions, second, extramural funding and third, specific research areas of high priority in my view.

I am quite concerned about the proposed reductions in research personnel from 1,554 in fiscal year 1982 to 1,303 in fiscal year 1983, roughly a cut of of one in six.

The Agency has been emphasizing the importance of good research management. I agree. There are two critical elements that are part of good management of research; a good staff and a stable base of supports.

I believe a reduction of this magnitude is greater than can be accommodated by administrative overhead changes and will have serious effects on the scientific diversity and the quality of the research staff.

Critical skills may be lost which cannot be readily replaced. Scientific investigators are not as moveable as regulatory or administrative personnel. A scientist engaged in aquatic toxic effects cannot easily suddenly become an expert in air pollution models.

Also, if additional operational regulatory responsibilities as to be placed upon State governments, the Federal research function becomes ever more critical. Generally, State governments, with only a few exceptions will need additional assistance, guidance, and information from EPA rather than less, if the States adopt the suggested regulatory responsibilities.

A second broad issue of my concern is the reduction in extramural funds available to non-EPA scientists and engineers. This reduction continues a trend which would reduce extramural funds from $198 million in fiscal year 1981 to the proposed $109 million for fiscal year 1983, which is less than 50 percent in 1981 dollars.

Such a reduction comes in the face of great uncertainty of complex issues such as whether toxic chemicals in the ambient environment are hazardous and how they move and are transformed. This funding for environmental research assures there is a community of scientists who provide a level of innovation and ideas not restricted to the role of the Federal establishment.

This funding also assures that there are scientists without a vested interest who can serve to review and criticize Agency scientific work. Such a reduction will inevitably reduce both the rate of growth of our intellectual capital and very substantially reduce the training and nurturing of a new generation of environmental scientists.

Our environmental well-being depends to a significant degree on having a cadre of well-trained scientists and engineers. It is difficult to establish a priori what a funding level should be. However, the fate of R. & D. generally in the Government this year suggests that environmental research funding ought to stay at least constant. Should the reduction be implemented, we will lose these scientists from environmental sciences and it will be difficult to regain them.

Third, I would like to address specific areas of high priority. One of the most critical is the broad area of toxic pollutants. There is great scientific uncertainty as to the effects of priority pollutants

in water and the effects of hazardous pollutants in air and the fate and effects of chemicals from dumps.

These scientific uncertainties are real and major. I fear that the reductions proposed in both dollars and Agency research staff implies that investigators will not be available inside or outside the Government to develop the needed information quickly enough.

Let me give some specific examples.

The water quality criteria that EPA has published have been heavily criticized because the data base is poor. With a few exceptions, they need to be completely redone with additional information. However, the budget would continue the reduction of the water quality research program from $61 million in fiscal year 1981 to $45 million in fiscal year 1982 to $27.7 million in fiscal year 1983, thus substantially reducing these efforts.

In addition, the water monitoring R. & D. efforts are being reduced while the measurement techniques still need considerable work and the quality assurance for monitoring is woefully inadequate. While the air pollution research program has not been reduced as much as water pollution research, it illustrates an additional set of problems. Even if the pace of new regulations is substantially slowed, the controversy over ambient air standards and especially hazardous air pollution will continue.

A reduction of roughly 13 percent in staff and resources can only slow down the acquisition of new information to help alleviate such controversies.

The monitoring effort for both air and water ought to be significantly improved. In particular, there is a very poor national data base for priority pollutants in surface and ground water. A major effort to establish measurement technologies, applicable quality assurance, and to fund a major national effort is needed.

We can make more efficient use of resources presently being expended with modest but clear commitment to such an effort. This Nation will spend over half a trillion dollars on pollution control over the next decade. A significant monitoring program to help determine whether and where that money should be spent would be very cost effective.

The committee also requested that I address the use of the Science Advisory Board within EPA. I was very pleased to see the Adminstrator's memo defining the role of the Science Advisory Board in reviewing Agency science, particularly as it related to regulatory decisions.

It is very important that the Board be used on those issues that are of high priority rather than being required to comment on all Agency actions. One of the issues that gets raised perennially is the question of selection of membership. Obviously, selection ought to be based on scientific credentials, but even gathering suggestions is tough.

I believe that a proper way would be for some official solicitation to several groups, such as the National Academy of Science, but with the final choice residing with the Administrator. Not all scientists, no matter how brilliant, are appropriate to such a group as the SAB, and the Administrator, in my view, must keep final authority for selection.

However, it would be very helpful to have a group such as the NAS provide a list of a dozen names each year from which to choose.

In conclusion, I feel that the budget reductions proposed will seriously undermine our intellectual bank account. I would recommend that the extramural funding at least be kept at fiscal year 1982 levels and preferably increased to that of fiscal year 1981. I would stress research on ecological and health effects of toxic materials, and monitoring technologies for priority and hazardous pollutants, and cost effective control technologies.

Finally, the Nation's monitoring program should be reviewed and strengthened.

Thank you very much, Mr. Chairman.

[The prepared statement of Dr. Dowd follows:]

Testimony of

Richard M. Dowd, Ph.D.

My name is Richard M. Dowd. I served as the Acting Assistant Administrator for Research in EPA from November 1980 until June 1981. In addition, I was the Executive Director of the Science Advisory Board and the Science Policy Advisor to the Administrator from 1977 through 1981. I am now employed as an environmental consultant in the private sector. My positions included that of chief scientist for Energy Environment and Natural Resources in the Congressional Budget Office and Assistant Commissioner for Policy Planning and Research in the Connecticut Department of Environmental Protection. In addition, I spent five years as Assistant Professor of Physics at Tufts University. My testimony reflects my professional judgement.

I would like to address the questions of priorities in research and the level of support for research within EPA and the use of the Science Advisory Board. I concur with the statements of Mrs. Gorsuch and Dr. Hernandez to the effect that the quality of EPA's science must be very high and that the research program should be focused "to emphasize results which relate directly to the Agency's regulatory programs and the country's most pressing environmental problems". However, I am concerned that many of the specific reductions in the proposed budget may, in fact, undercut those regulatory programs, and leave the Congress and the Agency in the position of not having enough information on which to base good decisions in the future. I plan first to discuss personnel reductions, secondly extramural funding, and thirdly specific research areas of high priority.

I am quite concerned about the proposed reductions in research personnel from 1554 in FY 82 to 1303 in FY 83 (roughly a cut of one in six). The Agency has been emphasizing the importance of good research management. I agree. There are two critical elements that are part of good management of research; a good staff and a stable base of support. I believe a reduction of this magnitude is greater than can be accomodated by administrative overhead changes and will have serious effects on the scientific diversity and quality of the research staff. Critical skills may be lost which cannot be readily replaced. Scientific invistigators are not as moveable as regulatory or administrative personnel; a scientist engaged in aquatic toxic effects cannot easily suddenly become an expert in air pollution models. Also, if additional operational regulatory responsibilities are to be placed upon State governments, the federal research function becomes even more critical. Generally, State governments fund very little research with only few remarkable exceptions, and will need additional assistance, guidance, and information from EPA rather than less, if states accept the suggested regulatory responsibilities.

A second broad issue of concern is the reduction in extramural funds available to non-EPA scientists and engineers. This reduction continuing a trend that would reduce extramural funds from $198 million in FY 81 to the proposed $109 million for FY 83 which is less than 50% in 1981 dollars. Such a reduction comes in the face of great uncertainty of complex issues such as whether toxic chemicals in the ambient environment are hazardous and how they move and are transformed. This funding for environmental research assures that there is a community of scientists who can provide a level of innovation and ideas not restricted to the role of the federal establishment. This funding also assures that there are scientists without a vested interest who can serve to review and criticise Agency scientific work. Such a reduction will inevitably reduce both the rate of growth of our intellectual capital, and very substantially reduce the training and nurturing of a new generation of environmental scientists. Our environmental well being depends to a significant degree on having a cadre of well trained scientists and engineers. It is difficult to establish a priori what a funding level should be, however, the fate of R&D generally in the government, suggests that environmental research funding ought to stay at least constant. Should the reduction be implemented, we will lose these scientists from environmental sciences and it will be difficult to regain them.

Thirdly, I would like to address specific areas of high priority. One of the most critical is the broad area of toxic pollutants. There is great scientific uncertainty as to the effects of priority pollutants in water and the effects of hazardous pollutants in air and the fate and effects of chemicals from dumps. These scientific uncertainties are real and major. I fear that the reductions proposed in both dollars and agency research staff implies that investigators will not be available inside or outside the government to develop the needed information quickly enough. Let me give some specific examples. The water quality criteria that EPA has published have been heavily criticised because the data base is poor. With a few exceptions they need to be completely redone with additional information. However the budget would continue the reduction of the water quality research program from $61 million in FY 81 to $45 million in FY 82 to $27.7 million in FY 83 thus substantially reducing these efforts. In addition, the water monitoring R&D efforts are being reduced while the measurement techniques still need considerable work and the quality assurance for monitoring is woefully inadequate.

While the air pollution research program has not been reduced as much as water pollution research, it illustrates an additional set of problems. Even if the pace of new regulations is substantially slowed, the controversy over ambient air quality standards and especially hazardous air pollution will continue. A reduction of roughly 13% in staff and resources can only slow down the acquisition of new information.

The monitoring effort for both air and water ought to be significantly improved. In particular, there is a very poor national data base for priority pollutants in surface and ground water. A major effort both to establish measurement technologies, applicable quality assurance, and to fund a major national effort is needed. We can make more efficient use of resources presently being expended with modest but clear committment to such an effort. This nation will spend our half trillion dollars on pollution control over the next decade. A significant monitoring program to help determine whether and where that money should be spend would be very cost effective.

The committee also requested that I address the use of the Science Advisory Board within E.P.A. I was very pleased to see the administrator's memo defining the role of the S.A.B. in reviewing agency science, particularly as it relates to regulatory decisions. It is very important that the Board be used on those issues that are of high priority rather than being required to comment on all Agency actions.

One of the issues that gets raised perenially is the question of selection of membership. Obviously selection ought to be based on scientific credentials, but even gathering suggestions is tough. I believe that a proper way would be for some official solicitation to several groups such as the NAS, but with the final choice residing with the Administrator. Not all scientists, no matter how brilliant, are appropriate to such a group as the SAB and the Administrator in my view must keep final authority for selection, however it would be very helpful to have a group such as the NAS provide a list of a dozen names each year from which to choose.

In conclusion, I feel that the budget reductions proposed will seriously undermine our intellectual bank account. I would recommend that the extramural funding be at least kept at the FY 1982 levels as preferably increased to that of FY 81. I would stress research on ecological and health effects of toxic materials and monitoring technologies for priority and hazardous pollutants and cost effective control technologies. Finally, the nation's monitoring program should be reviewed and strengthened.

Mr. WALGREN. Thank you very much, Dr. Dowd.

Let me ask if you would bear with me and alter the order just a little bit for Mrs. Schneider's schedule. That would mean going next with Dr. Johnson, if we could, and then Dr. Haun. Perhaps she will be able to stay throughout, but in case her commitments bind her, we would then at least have gotten to the industry witnesses directly.

Dr. Johnson?

## STATEMENT OF DR. JULIUS E. JOHNSON, CONSULTANT TO THE DOW CHEMICAL CO.

Dr. JOHNSON. Mr. Chairman, and members of the committee, my name is Julius E. Johnson, presently a consultant for Dow Chemical Co. I also serve in the Executive Committee of the Science Advisory Board for EPA. A more detailed description of my background relevant to this hearing is shown in appendix A of my written statement. I won't take time now to go into it.

I would like to divide this presentation into four parts. First, some comparisons of R. & D. in industry with R. & D. in EPA. Second, some conclusions I reached as a result of the Health Effects Research Study [1978 to 1979] done for the Science Advisory Board of EPA which I consider still useful today, even though it was done then. Third, a personal opinion concerning ORD in support of the use of science by EPA and whether that support should be primary, shared or contributory as part of the national R. & D. effort. And, fourth, the use of science by EPA.

Some comparisons of R. & D. in industry with R. & D. in EPA: I will list elements or characteristics of each sector which are similar and some which are different.

Similarities: Mission orientation with a preponderant emphasis on applied research development and problem solving.

Complexity, serving many different profit—program—centers, or serving many regulatory needs.

Short deadlines, intractable problems.

Need for a balance between short-term and long-term programs.

Need for planning, priorities, funding and people.

A requirement for stimulating an atmosphere for career development.

A constituency, not always patient, requiring results from money spent and confidence the money is spent well.

A requirement for "good science" upon which major decisions can be based with confidence.

A management environment in which exploratory or basic research is understood and protected.

A need to educate all levels of the organization on the importance of basic research.

An ability to change emphasis, to respond to new findings and new needs.

And, recognition of the importance of universities as a source of people in basic research.

Differences: Industry has greater flexibility in the use of manpower and money, hence can more quickly change direction.

Industry has more flexibility in rewarding good performance.

Industry is not as exposed to continuing public scrutiny and oversight.

Industry generally is less dependent on contracts and grants and can contract with less time-consuming procedural auditing.

There are more similarities than differences, and the most important similarities are mission orientation with a preponderant orientation to applied research and development.

Second, a requirement for "good science" upon which major decisions can be based with confidence.

Third, stimulating atmosphere for career development.

Need to educate all levels on the importance of basic research.

Ability to change emphasis to respond to new findings and new needs.

It is difficult indeed to reconcile a strong mission orientation with all the other requirements, and that is why leadership and management ability are critical to the success of research organization, either in industry or in EPA. The demands for effective leadership and management are even more severe in EPA because there is less flexibility.

An essential part of leadership and management is the ability to communicate with, educate and strongly influence the organizational customers of the scientific information. Whether these customers are congressional committees, program offices or profit center managers in industry, the job is essentially the same, namely, to establish a real understanding of the R. & D. process, the realities of gathering valid and defensible data, the time required to do it and the reliable sources from which such information may be obtained.

It is from fusion of management objectives and scientific realities, or limitations, that long-range planning comes about. Without the objectives expressed in terms of expected results, it is difficult or impossible for R. & D. to do effective planning on its own.

Generation of "intellectual capital" should be clearly stated as an expected result but with direction coming concerning priorities.

Some conclusions that I reached as the result of the Health Effects Research Study in 1978 and 1979, I still consider valid today.

I believe that it is critically important to have in each program office a strong representative of the R. & D. function who can perform the dual job described in appendix B and bring to ORD the needs of the program office and bring to the program office knowledge of the capacity and limitations of research.

The program office is the focal point of decisionmaking and good science is the focal point of good decisions.

A personal opinion where ORD supporting the use of science by EPA should be primary, shared or contributory as part of the national effort.

It is obvious that NASA is primary in space research. Their combination of grant, contract and inhouse work dominates the scene. No agency shares. Some may contribute. Universities and industries are contributory.

In certain fields, EPA should be primary. For example, analytical method development for monitoring. This should be a capability to which the country looks to EPA for preeminent performance.

The Bureau of Standards should have a contributory role, especially in the validation of methods. Likewise, the laboratories of industry, contract laboratories in universities would have a contributory role. But the major responsibility for performance, both short term and long term should reside in EPA, not a monopoly but a role of leadership and excellence.

In my opinion, in the field of environmental transformation, movement, and ecology, EPA should also play a primary role, drawing upon the monitoring methods to be applied to environment situations which are actually or potentially in need of observation or repair.

In the case of chemical processing technology and manufacturing plants, including synfuel plants, other organizations would be much better qualified and EPA would better serve a contributory role.

Acid precipitation is a field in which EPA should be primary. However, in the case of the suspected greenhouse effect from fossil fuel combustion, NSF should be primary or perhaps NOAA or DOE. In the case of the greenhouse effect there are few basic principles yet developed. We need a more fundamental approach for this and the NSF may be a better long-term sponsor in a primary role.

The same probably applies to stratospheric ozone changes. But a regulatory agency may not be the best place to provide the proper mix of skill and support to generate the required basic information. In the formulation of decisions as to what a regulatory agency should do, it appears to me that we should pay close attention first, whether or not the basic science has matured to a point where applied research can be properly directed.

Second, where, meaning location, the competence and leadership is to do the job both short term and long term.

Next, what resources should share or contribute, including the private sector.

And, last, in which agency or agencies will the preponderance of users of the information reside.

The opinions—primary, shared or contributory—that I have just expressed should be viewed as illustrations and not necessarily the right answer. EPA cannot be primary in all areas of R. & D. embraced by its regulatory charter. Choices must be made. Where EPA is primary, the programs, laboratories and personnel should be role models for the scientific community. If not primary, EPA should have "in-house"—in the organization—scientists who can tap that same excellence elsewhere.

An important first step for the Agency will be to decide where EPA should be primary, shared or contributory in its R. & D. capability.

The last point is the use of science by EPA. Considering the ultimate goals of EPA, it is evident that the program offices are, or need to be, the primary focus for the use of science in the Agency. ORD is a generator, gatherer, and evaluator, but the results, standards, rules, and regulations emerge from the program office.

In January of 1981, Walter Barber, Acting Administrator of EPA, asked some of us to characterize the use of science in EPA for standard setting and rule setting. Those comments were solicit-

ed by the previous administration for referral to the current leadership of EPA. The "white paper" I submitted February 10, 1981, is enclosed as appendix C and reflects my own characterization influenced by colleagues in the chemical industry from whom I solicited ideas. All to whom I talked wanted EPA to be an effective Agency. All recognized the need for regulation and all wanted to contribute to the process of developing good science as a basis for effective regulation.

Although the tone of this document, appendix C, may seem harsh, the intention was to deal with the important problems as I saw them.

It is my impression that progress is being made in certain areas such as quality assurance, peer review, the quality of publications, the redirection of the Science Advisory Board. Beyond these impressions, I have not been close enough to venture comment.

The principal reason for including this section, appendix C, is to emphasize the importance of considering the use of science by EPA as a background for defining the role of ORD.

The program offices are the focal point for the use of R. & D. resources of the agencies. These program offices can also be a focal point for misuse and abuse of science unless the right leadership exists to educate, influence, and put in perspective what is known, what is not known, and what needs to be known long term as well as short term.

I would like to conclude by presenting the opinion that the improvement of the ability of EPA to conduct long-range research necessary to generate "intellectual capital" will depend on; scientific leadership in ORD and the program offices; deciding which programs in EPA should be primary, shared or contributory; continual education on the importance of quality assurance and good science; peer review of work done inhouse, by grant and by contract including early involvement in the definition of plans and protocols, close interaction with scientists in the universities; and constructive interaction with scientists in industry.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Johnson follows:]

Presentation
Julius E. Johnson

Mr. Chairman, members of the Committee, my name is Julius E. Johnson, presently a consultant for The Dow Chemical Company. My working career since graduate school has been with Dow, beginning in 1943 with research on antimalarial drugs, then animal health products, agricultural chemicals, and later director of research. I have managed the agricultural and pharmaceutical businesses of Dow, have served as corporate vice president of research and development and have served on the board of directors and executive committee. Since retirement from line duties I have served on four committees of the National Research Council and two committees for EPA. Since October of 1980, I have served on the Executive Committee Science Advisory Board of EPA. A more detailed description of my background relevant to this hearing is shown in Appendix A.

Since the invitation, communicated by Mr. Clark, to appear at this hearing, I have been pondering how I could be helpful to the committee. My knowledge of the current status of research and development in EPA is not up to date. Although the Science Advisory Board is exposed to various aspects of R&D, few, if any of us, has knowledge in- depth of the overall balance, priorities, emphasis and programs. After the Health Effects Research Group Study (concluded February 1979) I had a good feel for the problems and direction in that part of the R&D activities of the Agency and assisted in writing the report[1]. From that experience I formed a number of opinions which may still be valid, but not necessarily up to date in the light of today's operation.

If you are expecting detailed comments on the proposed budget for ORD I cannot give them because I am not well enough informed. It would not be fair to the Agency for me to try. If you are expecting some comments on the elements of a R&D program leading to "good science" as a basis for regulatory planning and decisions, I may have an input which could be useful. On this latter premise I will proceed.

I would like to divide this presentation into four parts:

1. Some comparisons of R&D in industry with R&D in EPA.

2. Some conclusion I reached as a result of the Health Effect Research Study 1978-79 that I consider useful today.

3. A personal opinion where ORD (supporting the use of science by EPA) should be "primarily shared, or contributory" as part of the national R&D effort.

4. The use of science by EPA.

94-247 O—82——4

SOME COMPARISONS OF R&D IN INDUSTRY WITH R&D IN EPA.

I will list elements or characteristics of each sector which are similar and which are different.

Similarities:

- Mission orientation with a preponderant emphasis on applied research, development and problem solving.
- Complexity -- serving many different profit (program) centers or serving many regulatory needs.
- Short deadlines -- intractable problems.
- Need for a balance between short term and long term programs.
- Need for planning -- priorities, funding and people.
- A requirement for a stimulating atmosphere for career development.
- A constituency (not always patient) requiring results from the money spent and confidence the money is spent well.
- A requirement for "good science" upon which major decisions can be based with confidence.
- A management environment in which exploratory (or basic) research is understood and protected.
- A need to educate all levels of the organization on the importance of basic research.
- Ability to change emphasis, to respond to new findings and new needs.
- Recognition of the importance of universities as a source of people and basic research.

Differences:

- Industry has greater flexibility in the use of manpower and money; hence, can more quickly change direction.
- Industry has more flexibility in rewarding good performance.

Industry is not as exposed to continuing public scrutiny and oversight.

Industry generally is less dependent on contracts and grants, and can contract with less time-consuming procedural auditing.

There are more similarities than differences. The most important similarities are:

Mission orientation with a preponderant orientation to applied research and development.

A requirement for "good science" upon which major decisions can be based with confidence.

Stimulating atmosphere for career development.

Need to educate all levels on the importance of basic research.

Ability to change emphasis to respond to new findings and new needs.

It is difficult indeed to reconcile a strong mission orientation with all other requirements and that is why leadership and management ability are critical to the success of a research organization -- either in industry or EPA. The demands for effective leadership and management are even more severe in the EPA because there is less flexibility. An essential part of leadership and management is the ability to communicate with, educate and strongly influence the organizational "customers" of the scientific information. Whether these customers are congressional committees, program offices or profit center managers in industry, the job is essentially the same; namely, to establish a real understanding of the R&D process, the realities of gathering valid and defensible data,

the time required to do it and the reliable sources from which such information may be obtained. It is from this fusion of management objectives and scientific realities (or limitations) that long range planning comes about. Without the objectives, expressed in terms of expected results it is difficult or impossible for R&D to do effective planning on its own. Generation of "intellectual capital" should be clearly stated as an expected result but with direction concerning priorities.

SOME CONCLUSIONS I REACHED AS A RESULT OF THE HEALTH EFFECT RESEARCH STUDY 1978-79 THAT I CONSIDER USEFUL TODAY

Following the Health Effects Research Committee Report (February 1979[1]), Dr. Whittenberger and I testified before the Subcommittee On Natural Resources and Environment, chaired by Representative Jerome A. Ambro[2], February 1979. The material I presented went beyond the recommendations of the Health Effect Research Committee, as reported, but was of interest to the Agency. I was later asked to present a summary of the material to Mr. Douglas Costle, Administrator of EPA (Appendix B). The ideas expressed at this time, in my opinion, still apply in 1982. I believe that it is critically important to have, in each program office, a strong representative of the R&D function who can perform the dual job described in Appendix B and bring to ORD the needs of the program office and bring to the program office knowledge of the capacity and limitation of research. The program office is the focal point of decision making. "Good science" is the basis of good decisions.

A PERSONAL OPINION WHERE ORD (SUPPORTING THE USE OF SCIENCE BY EPA) SHOULD BE "PRIMARY, SHARED OR CONTRIBUTORY" AS PART OF THE NATIONAL EFFORT

It is obvious that NASA is primary in space R&D. Their combination of grant, contract and "in-house" work dominates the scene. No other agency shares. Some may be contributory. Universities and industry are contributory.

In certain fields, EPA should be primary. For example, analytical method development for monitoring. This should be a capability to which the country looks to EPA for pre-eminent performance. The Bureau of Standards should have a contributory role, especially in the validation of methods. Likewise, the laboratories of industry, contract laboratories and universities would have a contributory role but the major responsibility for performance, both short-term and long-term, should reside in EPA. Not a monopoly, but a role of leadership and excellence.

In my opinion, in the fields of environmental transformation, movement and ecology, EPA should also play a primary role, drawing upon monitoring methods to be applied to environmental situations which are actually or potentially in need of observation or repair.

In the case of chemical processing technology in manufacturing plants, including synfuel plants, other organizations may be much better qualified and EPA would better serve a contributory role.

Acid precipitation is a field in which EPA should be primary; however, in the case of the suspected greenhouse effect from fossil fuel combustion NSF should be primary (perhaps NOAA or DOE). In the case of the greenhouse effect there are few basic principles yet developed. We need a more fundamental approach and for this the NSF may be a better long-term sponsor in a primary role. The same probably applies to stratospheric ozone changes where a regulatory agency may not be the best place to provide the proper mix of skill and support to generate the required basic information.

In the formulation of decisions as to what a regulatory agency should do it appears to me we should pay close attention to:

- -- whether or not the basic science has matured to a point where applied research can be properly directed.
- -- where (location) the competence and leadership is to do the job, both short-term and long-term.
- -- what resources should share or contribute - including the private sector.
- -- in which agency or agencies will the preponderance of users of the information reside.

The opinions (primary, shared or contributory) that I have expressed in the foregoing should be viewed as illustrations not necessarily as the "right" answers.

EPA cannot by primary in all the areas of R&D embraced by its regulatory charter. Choices must be made. Where EPA is primary, the programs, laboratories and personnel should be role models for the scientific community. If not primary, EPA should have (in-house) in its organization scientists who can tap that same excellence elsewhere. An important first step will be to decide where EPA should be primary, shared or contributory in its R&D capability.

THE USE OF SCIENCE BY EPA

Considering the ultimate goals of EPA it is evident that the program offices are, or need to be, the primary focus for the use of science by the Agency. ORD is a generator, gatherer and evaluator but the result (standard, rule, regulation) emerges from the program office.

In January of 1981, Walter Barber, Acting Administrator of EPA, asked some of us to characterize the use of science in EPA for standard setting and rule setting. Those comments were solicited by the previous administration for referral to the current leadership of EPA. The "white paper" I submitted February 10, 1981 is enclosed as Appendix C and reflects my own characterization, influenced by colleagues in the chemical industry from whom I solicited ideas. All to whom I talked wanted EPA to be an effective agency, all recognized the need for regulation and all wanted to contribute to the process of developing "good science" as a basis for effective regulation. Although the tone of this document may seem harsh, the intention was to deal with important problems as I saw them.

It is my impression that progress is being made in certain areas such as quality assurance, peer review, the quality of publications and the redirection of the Science Advisory Board. Beyond these impressions I have not been close enough to venture comment.

The principal reason for including this section (Appendix C) is to emphasize the importance of considering the use of science by EPA as a background for defining the role of ORD. The program offices are the focal point for the use of R&D resources of the agencies. These program offices can also be a focal point for misuse and abuse of science unless the right leadership exists to educate, influence and put in perspective what is known, what is not known and what needs to be known long-term as well as short-term.

I would like to conclude by presenting the opinion that the improvement of the ability of EPA to conduct long-range research necessary to generate "intellectual capital"[4] will depend on:

Scientific leadership in ORD and the Program Office.

Deciding which programs in EPA should be primary, shared or contributory.

Continual education on the importance of quality assurance and "good science".

Peer review of work done; in-house, by grant and by contract (including early involvement in the definition of plans and protocols).

Close interaction with scientists in the universities.

Constructive interaction with scientists in industry.

APPENDIX A

Education: A.B. 1939 U. of Colorado - Major in Chemistry
Ph.D. 1943 U. of Illinios - Major in Biochemistry
Minor in Organic Chemistry
Minor in Physiology

Harvard Advanced Management Program - 1967

Dow Assignments: Research on antimalarial drugs and animal health products - 1943-1952

Director of Agricultural Chemical Research - 1952-1962

Manager of Agricultural Chemical Department - 1962-1963

Manager of Agricultural Chemical and Pharmaceutical International Operations - 1963-1965

Assistant to the Director of Research - 1965-1968

Director of Research - 1968-1971

President of Pharmaceutical and Diagnostic Business - 1971-1976

Member of the Dow Board of Directors - 1968-1978

Vice President and Member of Executive Committee - 1969-1976

Chairman of the Corporate Ecology Committee - 1970-1971

Consultant 1978 to present

Committees: Department of Health Education and Welfare

Secretary's Commission on Pesticides and Their Relationship to Environmental Health (Mrak Commission) 1969

National Academy of Sciences - National Research Council

Commission on Natural Resources - 1975-1978

International Environmental Programs Committee - 1978-1981

Committee on Mineral Technology Options - 1980-1981

Board on Toxicology and Environmental Health Hazards - 1978-1980

Environmental Studies Board - 1981-

Environmental Protection Agency

Health Effects Research Review Group of the Science Advisory Board - 1978-1979

Science Advisory Board - Executive Committee
1980 to completing of term September 1982

APPENDIX B

THE DOW CHEMICAL COMPANY

BENNETT BUILDING
2030 DOW CENTER
MIDLAND, MICHIGAN 48640

July 12, 1979

Mr. Douglas Costle
Administrator
United States Environmental
Protection Agency
Washington, D.C. 20460

Dear Mr. Costle:

Enclosed is a copy of the draft submitted to Dr. Whittenberger, chairman of the Health Effects Research Advisory Committee.

The "matrix" concept we discussed is summarized, and the "Job Performance Reviews" are described on pages four and six, respectively.

Copies have been sent to Steve Gage and Dick Dowd.

Very truly yours,

Julius E. Johnson

Julius E. Johnson

cc: Dr. Richard Dowd
Dr. Steven Gage

The research results which are most responsive to the mission, the priorities and the quality needed to support the regulatory process are those with a close working relationship and understanding between scientists in the laboratory and their counterparts in the program offices. Poor results were seen all too often, however, because close relationships did not exist.

The large staff working within ORD in Washington (with few exceptions) was seen as a hinderance to good performance by ORD. In many cases the staff presents a costly obstruction to the establishment of a good research program in EPA.

Pilot research committees have helped to establish essential communications between those who have direct (and indirect) responsibilities. Where successful, the resulting agreements (Drinking Water and Pesticides) have helped to make research more responsive, and have cut across jurisdictional barriers to establish objectives, goals and plans.

The committees are a means to an end but shorter and more direct communication lines are needed between data generators and data users.

It may be hopeless to think in terms of organizational structures to streamline decision making. Hoplessness was expressed many times by those concerned when faced with the seeming obdurate character of the Civil Service system and the highly placed, inflexible and less than adequate individuals who occupy many unneeded positions. The inflexibility makes it very difficult indeed to place people properly, to reward people properly, to recognize people properly and to transfer or get rid of people not performing up to expectations in their job.

Recent changes in the law were not seen as adequate to effect much improvement. Security is a strong preoccupation in many minds. Change can occur but it will require enormous effort and training

in the principles of management by objective and job performance evaluation to establish a clear understanding of what is expected of each employee.

Many good people in EPA expect and deserve to work within a more effective and efficient system where objectives, goals and plans form the basis of measuring job performance.

ORD leadership should take steps as soon as possible to work out understanding with AA's in the program offices to simplify and shorten lines of communication and to cut to a minimum the reprocessing of decisions by the Washington staff of ORD.

It is recommended that each Assistant Administrator for a program office have an R&D director reporting jointly to him and to the Assistant Administrator for ORD. Definition of needs, identification of resources, assignment of budgets, reporting and interpreting of results would be managed primarily by these program-related R&D directors who would be major managers reporting to each A.A. This R&D director would be the functional research representative in the program office with rank equal to deputy administrators. (He needs status to cope with equals in the program office. See Job Function Summary A below.)

The same R&D director would also serve on a "Research Council" headed by the A.A. for ORD. The Research Council would include research directors in each respective program office, major laboratory research directors (e.g., Cincinnati and RTP, Job Function Summary B), and others as deemed necessary by the A.A. for ORD. The function of the "Research Council" would be to communicate matters of common interest, to constantly review research policy matters, to critically analyze performance, to identify competence and select key personnel, to reconcile conflicts in matters of where

work can be done best, to build centers of excellence which thrive best within EPA jurisdiction and to encourage support of work elsewhere (interagency or grant or contract) when competence is elsewhere. In other words, to serve as the key management group for the R&D function which serves program needs.

There would be differing emphasis, however. Those reporting also to program offices would primarily deal with what research is to be done while those directing the laboratories would primarily deal with how it is done. Both must insist on high standards of quality. Within such a management framework the relative balance between short-term research needs and long-term (anticipatory) research could be analyzed, supported and protected. The key leadership as a group would be aware not only of their parochial needs but also the gaps in information which require attention now (by establishing longer term projects) in order to have answers ready and to avoid surprises later. Such foresight comes from involvement with and sensitive awareness of advancing science and technology. Such awareness also requires a constructive relationship with those being regulated.

A clearer understanding of the key leadership jobs can be gained from sample job descriptions and a comparison between them. These are written in a style that was originated by the E. N. Hay associates and has proven useful in a number of organizations. The emphasis on job function, know-how, problem solving and accountability serves well in describing a job.

JOB FUNCTION SUMMARY A

Function:

Under the program guidance of the Assistant Administrator for _____ and under the functional guidance of the Assistant Administrator for ORD, supports the R&D efforts (EPA, interagency and extramural) necessary to meet both long and short-term needs of the program office. Analyzes and helps to interpret information required to support regulatory activities. Represents program needs to the ORD function, establishes priorities for R&D projects needed to support decision making by the program office.

Know How:

PhD or equivalent in the appropriate field of science or engineering and good understanding of toxicology and public health, and environmental protection. Supporting training in analytical sciences. Experience in practical problems of risk assessment; appreciation for economic and political issues; human relation skills needed to communicate and persuade where direct authority is not clear. Ability to work with a team, to manage by objective and to maintain excellence of professional input.

Helps to define information needs, surveys resources, decides preferred approaches, reconciles differences, competes (cooperatively) with peers for resources, participates in budget distribution, communicates continually with R&D counterparts who will implement research projects, reviews progress, appraises results.

Problem Solving:

In cooperation with the Assistant Administrator for the program office or appointed staff, resolves what information is needed from ORD to meet program needs and when it is needed. Assigns priorities and plans the flow of work. (When mandates present unachieveable deadlines, points this out.) Communicates frequently and involves key laboratory directors in the formulation of plans. Participates with R&D peers including key laboratory directors to formulate realistic priorities, plans, time schedules, and allocation of budget.

Participates in key policy matters affecting the distribution of research to other agencies and extramural programs so that a pattern of appropriate duration of support can be foreseen. Participates in performance reviews of key people who potentially may be selected for promotion or future leadership. Participates in "Research Council" meetings. Supports the program office in meeting regulatory obligations. Demands that R&D input be credible and defensible.

Accountability:

Accountable for timely and defensible information output indirectly affecting 200 million people. Shared accountability for the efficient use of $_____, the R&D budget assigned to the program office. Directly accountable for a staff group comprising _____ technical and _____ non-technical and _____ temporary people.

JOB FUNCTION SUMMARY B

Function:

Under the functional guidance of the Assistant Administrator for ORD implements the R&D programs deemed necessary to meet decision-making needs of the respective program offices (short-term and long-term). Develops and maintains a research organization able to meet the challenges of a regulatory agency and able to manage supplemental extramural effort (interagency, grant and contract). Optimizes the mix of in-house and extramural effort to meet and to anticipate the scientific information needs of the agency in a timely manner.

Know-How:

PhD or equivalent in science with specialization relating to the project needs of the specific laboratory. Experience in recruiting, leadership development and motivation of professional research personnel including those assigned to the more difficult (and less visible) technical problems. Human relation skills necessary to communicate, persuade and manage where direct authority is not clear. Experience in the administration of grants and contracts and the associated needs for quality assurance. Ability to work with a team, manage by objective and maintain excellence of professional input.

Problem Solving:

Under direction of the A.A. for ORD and in cooperation with the director of ORD for the program offices, reconciles needs with

abilities to perform, establishes priorities, plans flow of work, assigns resources and establishes feedback communication. Appraises scientific results and aids in judgements where needed to assist decision making. Builds responsive program capability and leads in a way to establish a highly respected research organization in carefully selected areas of endeavor.

Participates with R&D peers including direction of research for the program office to formulate realistic priorities, plans, time schedules, and allocation of budget.

Participates in key policy matters affecting the distribution of research to other agencies and extramural programs so that a pattern of appropriate duration of support can be foreseen. Participates in performance reviews of key people who potentially may be selected for promotion or future leadership. Participates in "Research Council" meetings. Supports the program office in meeting regulatory obligations. Demands that R&D input be credible and defensible.

Accountability:

Accountable for leadership and maintenance of a laboratory, highly respected for excellence of timely output of scientific data needs by EPA for decision making involving _____ technical, _____ non-technical and _____ temporary people and an annual budget of $_____ to $_____.

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What has been described in the leadership relating respectively to the program offices and the key laboratories is a form of matrix management. The people selected must have a stature and capability that they gain the respect of the scientific community. It is believed that such people exist within EPA but the selection process should go beyond and include candidates now working in other laboratories.

If such a leadership can be identified and placed as described, it should help to lend continuity to research policy. Continuity is much needed to insure survival of long range programs, strength of good technical common sense and foresight now conspicuously lacking.

In an organization as heterogeneous as EPA, it will be a very difficult job to implement the concept of management by objective in a way that improves the job satisfaction of people at all levels. (Research Pilot Committees present a sample of the difficulties but the result is worthwhile). Training is necessary! Not training in a gradiose sense but training persistently dedicated to involvement of the "little guy" and what his job is all about. Supervision is the key to success whatever the level. Without understanding and dedication to the potential benefits of training by supervision, the task is hopeless and change will not occur.

Training should be initiated (training the trainers) by professionals with experience working in complex organizations. The initial steps of training might well be what is called RIGS--Results, Indicators, Goals--requiring two-day sessions and workships which define the <u>results</u> (not activities) each man expects of his work, the indicators of success (and failure) and the goals of when these results will be accomplished. These fundamental units; namely,

what is expected and agreed by employee and boss forms the basis for better job performance reviews, better understanding of mission and improved job satisfaction.

Finally, it might be added that the concept of Results, Indicators and Goals applies equally well at the level of the agency head. The administration of EPA might be asked to develop a list of the results he wanted from ORD, the indicators he would use to measure progress and the timing. A sample of how this might be conceived is given below. (Goals have been omitted because this exercise really needs to be worked out by "live players" not advisory committees.

| Result | Indicator |
| --- | --- |
| Defensible data (and methods) for decision making | Reports and publication accepted by peers.<br>Data sustained in court.<br>Reduced controversy.<br>Program office support.<br>Agreed priorities. |
| Fewer (or no) surprises | Information available on time.<br>Projects started in anticipation of need.<br>Reduced controversy.<br>Supportive Congressional oversight. |
| Scientific integrity (creditable research base) | Peer support.<br>Support of the regulated.<br>Less controversy.<br>EPA seen as a good place to develop a career.<br>Publications in peer review journals. |
| Cost effectiveness | Favorable ratios compared with other labs.<br>OMB opinion.<br>Professional research manager opinion.<br>GAO opinion.<br>Peer opinion. |

APPENDIX C

Characterize the use of science in EPA for standard setting and rule setting.

February 10, 1981

The use of science in EPA is inadequate to achieve the results desired by Congress in a trustworthy and timely manner. Regulations and rules based on inaccurate and unduly hurried scientific input do not serve well the credibility of EPA here or abroad. In some cases the legislative mandates and deadlines are themselves intrinsic to the problems.

The quality of the science input by the "in house" research of EPA varies widely. Some laboratories do good work and are recognized as capable by their peers. Other laboratories are floundering for lack of clear and sustained objectives, goals and plans to make their input an effective part of the mission of EPA. Management is often poor.

The generally mediocre image of research quality in EPA makes it difficult to attract and hold capable people. Inadequate ability and practices in the use of science makes EPA unattractive to leaders in academic research as a funding agency from which to solicit meaningful grants. In recent years, however, close attention to assure peer review has helped improve the quality of the grant programs that do exist.

Information obtained through contracts is frequently of poor quality. Contracts issued by the Program Offices in particular have, too often, been ill conceived, poorly reviewed, poorly executed and poorly monitored. The resulting inadequate quality of data and advice obtained through contracts has been a contributing factor in diminishing overall confidence in the ability of EPA to regulate on a scientifically sound basis.

The quality of scientific input to EPA from the industrial sector varies widely and is frequently poor or absent. Most larger companies are improving their capabilities to support products and operations with scientifically reliable data. Smaller companies, without depth of financial and technical resoures, are encountering greater difficulties..

By far the most important criticism of the use of science in EPA is addressed at the decision making process largely managed by the Program Offices. All too frequently it appears that the regulation, rule or standard is decided before the scientific basis has been determined and validated. Even worse it appears that data are selected and massaged to fit a policy the agency wishes to justify. From an array of data, good and bad, the decision maker appears to select, without regard to quality, that which suits their particular regulatory objective. Peer review, if it occurs, comes far too late to avert serious errors in judgment. Once a position is taken by the agency, even though wrong, it is almost impossible to clear the air and reassure the public because of the intense adversarial relationship between EPA and the industries it regulates. The research committee approach has been helpful in defining better the priorities, agenda and objectives between ORD and the Program Offices but progress is slow and many obstructions remain.

Regretably, abundant evidence exists to support the characterization described above. This evidence could be provided by documents, through SAB hearings or even Congressional hearings if desired. Time might be spent better, however, by accepting the past, learning from it and looking to improvements that can be made.

How Can the Quality of Science Be Enhanced in EPA?

At the very beginning of her term the Administrator could declare that regulatory rules, standards and decisions will be formulated on the basis of high quality scientific evidence and if evidence is lacking decisions will be based upon the best scientific judgment available.

The Administrator could make clear at the outset that the mission of EPA is not to ban chemicals or other products of industry but to regulate in a manner that protects man and the environment within the context of economic growth and development; also essential for quality of life.

The Administration could make clear that quality assurance practices will be strengthened to improve the reliability of data regardless of the source.

Each Program Office should include in its leadership a scientist who is a good communicator, respected by his peers, to serve as the linkage between ORD and the Program Office, to oversee the quality of information being used for decision making, to help prioritize the issues, to schedule the proper timing of peer reviews and to play a major role in asssuring that rules and regulations will be defensible on a scientific basis. Such an appointee should have a salary and rank of Deputy Assistant Administrator, or, at least job elements, salary and rank no less than lawyers assigned to the Program Office by the Office of General Counsel.

Independent peer review should be initiated early in the process of fact finding, in support of rules, standards and regulations. The Science

Advisory Panel of FIFRA is a model which is working well and should be studied and applied in support of other programs. The accountability of the FIFRA panel to Congress, the requirement for open meetings for independent input and the reporting of panel conclusion in the Federal Register are features which improve the quality of decisions made by FIFRA. Panel members are willing to serve because they find the effort stimulating and useful. They are involved throughout the process and are not in the position of rendering "after the fact" advice or token support.

Make an early effort to check the quality of contract research conducted for the agency because of the evidence that much contract work is poorly planned, poorly done and inadequately monitored. For certain types of work it may be more cost-effective to use money budgeted for contracts to hire technical people to work in EPA laboratories and thereby develop a more reliable continuing expertise. It is urgent that proper peer review be employed on contracts as well as grants. Contracts should be awarded with greater attention to quality as part of the requirement. The lowest cost bid may provide inferior data. Monitoring of contract performance should be increased by providing adequate travel allowance in the budgets to support the site visits needed.

Many observations and some studies of the use of science by EPA have been made by scientists outside the agency. It may be possible after careful review of qualifications, to induce one of these people to serve as temporary "Science Ombudsman" in order to communicate lessons from the past and help the new administration more quickly grasp the problems basic to improvement of the quality of the use of science. Such an individual would be most effective working between the Administrator, ORD, the

Program Offices and SAB helping to sensitize and advise the new team during the first few months of office.

Make sure that qualified input by the scientists in the organization is not suppressed by the bureaucratic processes which have been developed for rule and standard setting. EPA does have good scientists -- set them free to make their contribution.

Open dialogue between industry, adacemic, public interest and government scientists would help to supply better and more timely information to EPA. You will find that most companies in the chemical industry are dedicated to the proposition that "good science" should be the foundation for good regulation. Dialogue with all types of industry would help to understand the extent of their dedication to the same principle.

Selection of priorities would be improved if exposure were a more important consideration or "trigger" in the evaluation of relative risk. Compounds or products produced in small volume may have relatively little environmental impact and, even if highly toxic, their production and use may present only a minimal hazard. Perhaps some relief could be given to small business if the potential for exposure were assessed first before demanding detailed toxicological information.

Be cautious about the use of computer models. Elegant models can produce impressive numbers that are worthless unless the model has been carefully validated, or if poor data are used for basic input. The model approach is enticing but simplistic. Risk analysis is difficult, at best, and needs to

be made on a case by case approach. Likewise "categories" of chemicals can be a simplistic approach.

Eliminate publications by EPA that are not based on good scientific principles including articles used as promotional literature to arouse public support concerning issues which may or may not be of real environmental significance. Such articles are a deception and damage the scientific credibility of EPA.

How can the efficiency and effectiveness of the Science Advisory Board of EPA be improved?

Long term it is hoped that the agency will mend its ways and improve the quality of scientific input used in decision making. As credibility improves and confidence grows there will be less need for independent scientific oversight.

Unfortunately, short term, EPA does not enjoy such confidence and there is a widespread belief in the scientific community, that independent oversight is needed. This puts a heavy burden on those scientists willing to take time from busy schedules to help reinforce, not just review, the quality of the use of science by EPA. The long term goal of SAB should be to work itself out of a job. The short term prospect requires more independent review and involvement, not less.

The efficiency and effectiveness of SAB and its related subcommittees and panels could be improved in several ways:

1. Have fewer meetings on an "as needed basis".

2. Reduce the number of participants in SAB and subcommittees.

3. Use small task forces or single individuals to attack issues which do not require a broad concensus. The SAB could then confirm or revise the recommendation.

4. Strengthen the time commitment of the staff assigned to SAB and insist on well prepared documents to be in hand well ahead of a meeting. Minutes should be supplied soon after a meeting. The staff should screen out matters not appropriate to SAB.

5. Make it possible for a chairman of SAB to spend time with the principals involved including the Administrator of EPA in order to help provide a sensitive link between the needs of the agency and the needs for advise not necessarily requested by the Administrator.

6. Employ professional societies as a source of recommendations for committee, panel or peer review appointments.

7. In view of the demands that may be expected for peer review and independent oversight consider some unique approaches to providing a reservoir of capable people who can spend enough time to do the job at least for the next 3 years.

The question concerning efficiency and effectiveness of SAB deserves more extensive consideration, therefore, it is recommended that the chairman of SAB appoint a small committee of (1 - 3) to consider the FIFRA model (under Question 2) and to investigate various other possibilities and to work with the SAB staff in formulating a set of recommendations to bring before the Administrator and appropriate committees of Congress.

Julius E Johnson
2/10/81

APPENDIX D

References

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4. Brown, George E. and Byerly, Radford, "Research in EPA: A Congressional Point of View", Science, 211, 27 March 1981, p. 1385.

Mr. WALGREN. Thank you very much, Dr. Johnson.
Dr. Haun?

**STATEMENT OF DR. J. WILLIAM HAUN, CHAIRMAN, NATIONAL ASSOCIATION OF MANUFACTURERS COMMITTEE ON ENVIRONMENTAL QUALITY**

Dr. HAUN. Thank you, Mr. Chairman.

I am J. William Haun, vice president for Engineering Policy at General Mills, and I might say a past chairman of the Environmental Quality Committee of the National Association of Manufacturers for 6 long years of the environmental decade of the 1970's, an interesting and active period.

The NAM really appreciates this invitation to testify on the reauthorization of the R. & D. program. Just briefly, the statements on NAM are set forth on the outset of the written testimony about our membership and related companies. I would suggest that you might want to read those at your leisure.

Frankly, EPA's R. & D. program is a bit of a mystery for those of us in industry. There has been controversy over its quality. There have been doubts expressed over its utility and we believe that the fundamental problem is that Congress should adopt a sharper definition of the role and objectives of research within EPA.

A constant problem in the management of research arises from the growth of administrative forces as opposed to what I call the "belly to the bench" researcher. I would not be surprised, and the last time I was asked to look at the EPA program, it seemed to me there were excess layers of bureaucracy that could be peeled away with positive effects on the output of the Agency, at least the office of R. & D.

It should be kept in mind that industry has been conducting research on and development of solutions to environmental problems for many years, dating back to the formation as early as 1907 of the Smoke Prevention Council in Pittsburgh, which later grew to be the present day Air Pollution Control Association, a professional association with more than 8,000 members; the invention of the electrostatic precipitator by Dr. Cottreil in 1912; and the Mellon Institute entering into air pollution work as early as 1914, with the support of private companies.

Many devices to control water pollution were developed before the turn of the century. Many industrial companies are, today, engaged in developing, designing, manufacturing, and installing pollution controls systems. We feel it is extremely important that EPA's R. & D. program not duplicate these private sector activities.

We believe there have been occasions when EPA money was used for demonstration projects for technologies which had already been demonstrated but not used because of economic considerations. Both pilot plant and demonstration plant projects can be terribly expensive. This is my particular area of professional expertise.

However, there are areas in which a Government research program is appropriate where adequate private research programs do not exist or the programs cannot be financed with private funds. The NAM Board of Directors has urged adoption of a national science policy designed to, among other things, provide a coordinating

mechanism to enable all the agencies and instruments of Government including those involved in national defense to make the best use of their resources and to coordinate and integrate both the thrust and level of their science and technology programs in view of the national needs.

We say that what we seek is better coordinated Government activities in this field and not necessarily a larger role for Government.

Areas in which Government research may inherently be needed include health and environmental effects, development and proving of new analytical techniques and instruments, large-scale monitoring of ambient levels of air and water quality.

Information on the significance of low concentrations of chemical substances which can now be measured is certainly needed to improve public policy decisions on regulating hazardous waste, ground water quality and I might add many other regulatory programs.

Cooperative programs with, for example, the National Bureau of Standards and/or the National Standards Institute could improve the credibility of EPA research because of the strong peer review mechanisms that work within those organizations.

I wish to emphasize, again, the great reservoir of expertise that resides in industry. The NAM Environmental Quality Committee is comprised of more than 250 members, most of whom head of the environmental protection programs of their respective companies. Some of them are responsible for more than 100 plants located in the United States and other countries around the world.

They are administering programs which involve total costs of billions of dollars each year. We find they are highly conscientious about their obligations for compliance with the environmental laws and regulations. We regard them as a unique body of industrial expertise in the pollution control field.

In the same spirit in which the President created the Task Force on Private Sector Initiatives, of which the NAM president, Alexander Trowbridge, is a member, we offer our cooperation in working with EPA to come up with solutions to many difficult environmental problems.

We strongly and respectfully urge you in your reauthorization deliberations to produce legislation which will help weld together the constructive forces of industry and Government. Perhaps if EPA would establish industry advisory committees in each category of industry, it could get direct expert advice as to the available pollution control technology, the costs involved, the energy use involved, the environmental side effects from overly stringent single-media standards, such as resultant sludge and other solid waste problems from varied type water pollution control standards, and reasonable ranges within which standards might be set.

This technique has been successfully used by the Ohio River Valley Water Sanitation Commission, Orsanco, an eight-State in-

terstate compact organization. The results were dramatic. For example, over the period since Orsanco began to function, more than 138 species of fish have returned to the main stem of the Ohio River having once vanished.

The NAM thanks the distinguished subcommittee for this opportunity to present our views.

[The prepared statement of Dr. Haun follows:]

TESTIMONY OF
DR. J. WILLIAM HAUN
VICE PRESIDENT FOR ENGINEERING POLICY
GENERAL MILLS, INC.
ON BEHALF OF
NATIONAL ASSOCIATION OF MANUFACTURERS
"REAUTHORIZATION OF EPA R & D PROGRAM"
BEFORE THE
SUBCOMMITTEE ON
NATURAL RESOURCES, AGRICULTURE RESEARCH & ENVIRONMENT
COMMITTEE ON SCIENCE AND TECHNOLOGY
U. S. HOUSE OF REPRESENTATIVES
FEBRUARY 24, 1982

Introduction

I am Dr. J. William Haun, Vice President for Engineering Policy, General Mills, Inc., Minneapolis, Minnesota, and a Past Chairman of the Environmental Quality Committee of the National Association of Manufacturers.

The National Association of Manufacturers greatly appreciates the invitation from this distinguished Subcommittee to testify on reauthorization of the research and development program of the U. S. Environmental Protection Agency. NAM is a voluntary association of some 12,000 enterprises engaged in manufacturing in the United States. These enterprises account for about 85 per cent of the manufactured goods produced in the U. S. and about 80 per cent of the jobs created by manufacturing enterprises. An additional 158,000 companies are affiliated with NAM through the National Industrial Council and the NAM Associations Department. The laws and regulations administered by EPA impinge directly on the manner in which these enterprises

carry out their manufacturing operations. Therefore, we are profoundly concerned with all aspects of EPA's activities.

Role of a Research and Development Program

Frankly, EPA's R & D program is somewhat of a mystery to many of us in industry. There has been controversy over its quality and there have been doubts expressed over its utility. We believe the Congress should adopt a sharper definition of its role and objectives.

A constant problem in management of research arises from the growth of administrative forces as opposed to the "belly-to-the-bench" researcher. I would not be surprised to discover an excess layer or layers of bureaucracy that could be removed with positive effects on output.

It should be kept in mind that industry has been conducting research on and development of solutions to environmental problems for many years, dating back to the formation in 1907 of the Smoke Prevention Council in Pittsburgh (which grew to become the present-day Air Pollution Control Association with more than 8,000 members); the invention of the electrostatic precipitator by Dr. Cottrell in 1912; and the beginnings of air pollution control research at Mellon Institute in 1914. Some devices to control water pollution were developed before the turn of the century. Many industrial companies are engaged in developing, designing, manufacturing, and installing pollution control systems. It is extremely important that EPA's R & D program not duplicate these private sector activities. There appears to

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nave been occasions wnen EPA money was used for demonstration projects for tecnnology already demonstrated but not used because of economic considerations. Botn pilot plant and demonstration plant projects can be terribly expensive.

However, tnere are areas in wnicn a government researcn program is appropriate wnere adequate private researcn programs do not exist or tne programs cannot be financed witn private funds. Tne NAM Board of Directors nas urged adoption of a national science policy designed to, among otner tnings, "Provide a coordinating mecnanism to enable all tne agencies and instruments of government, including tnose involved in national defense, to make tne best use of tneir resources and to coordinate and integrate botn tne tnrust and level of tneir science and tecnnology programs in view of tne national needs, mission requirements and national priorities. Wnat we seek is better coordinated government activities in tnis field and not a larger role for government."

Areas in wnicn government researcn may innerently be needed include:

- Healtn and environmental effects.
- Development and proving of now analytical tecnniques and instruments.
- Large-scale monitoring of ambient levels of air and water quality.

Information on tne significance of low concentrations of cnemical substances wnicn can now be measured is certainly needed to improve public policy decisions on regulating nazardous wastes and groundwater quality. Cooperative programs witn, for example,

tne National Bureau of Standards and/or tne American National Standards Institute could improve tne credibility of EPA researcn because of tne strong peer review mecnanisms at work in tnose organizations.

I wisn to empnasize again tne great reservoir of expertise tnat resides in industry. Tne NAM Environmental Quality Committee is comprised of more tnan 250 members, most of wnom nead up tne environmental protection programs of tneir respective companies. Some of tnem are responsible for more tnan 100 plants located in tne United States and otner countries around tne world. Tney are administering programs wnicn involve total costs to American industry of billions of dollars eacn year. Tney are nignly conscientious about tneir obligations for compliance witn environmental laws and regulations. We regard tnem as a unique body of industrial expertise in tne pollution control field.

In tne same spirit in wnicn tne President created tne Task Force on Private Sector Initiatives, of wnicn NAM President Alexander B. Trowbridge is a member, we offer our cooperation in working witn EPA to come up witn solutions to difficult environmental problems. Tnerefore, we strongly and respectfully urge you in your reautnorization deliberations to produce legislation wnicn will weld togetner tne constructive forces of industry and government.

If EPA would establisn industry advisory committees in eacn category of industry, it could get direct expert advice as to available pollution control tecnnology, costs involved, energy use involved, environmental side-effects from overly stringent

single-media standards (such as resultant sludge and other solid waste problems), and reasonable ranges within which standards might be set. This technique has been successfully used by the Ohio River Valley Water Sanitation Commission (ORSANCO), an eight-State interstate compact organization, and the results were dramatic. More than 138 species of fish returned to the main stem of the Ohio River a number of years ago.

The National Association of Manufacturers thanks this distinguished Subcommittee for its consideration of our views.

Mr. WALGREN. Thank you very much for your testimony, Dr. Haun.

Dr. Lave?

## STATEMENT OF DR. LESTER B. LAVE, BROOKINGS INSTITUTION

Dr. LAVE. Since I am going to take issue with some of the things that people have said before me, I ought to start off by naming some premises that I think we all hold. First, we are all for environmental protection and especially to prevent significant adverse health effects. Second, we all believe that scientific data and research ought to be used in formulating regulations and that we need better data in order to make better decisions.

Third, instead of the Federal Government taking over everything in the world, Federal activities ought to be confined to those areas that are not done better by States and by the private sector.

The fourth is that we are in an era of budget stringency right now. Casually recommending more funds for EPA R. & D. is not responsible. We must look at these figures very carefully and decide what it is we can afford and what it is we need to do in these areas.

The final one is that these are complicated problems and the solutions are not likely to be intuitive ones that simply come from intuitions or guesses.

Having always been an outsider with respect to EPA, I can start off by saying that I think a hard look at EPA R. & D. is long overdue. There has been a lot of waste in that area, and that the administration's stated aims should be applauded.

While I say that, I also note that the fiscal year 1983 proposed budget represents a 45-percent cut in constant dollars from fiscal year 1981, and a much greater than that cut from fiscal year 1979. That clearly is too much. However much I think that there were moneys wasted in the past, I cannot believe that the proposed budget is sufficient to do what EPA is charged to do.

Another consequence of these cuts, particularly in personnel, are that there are a lot of square pegs that are going to be put in round holes. Dr. Dowd emphasized that point. Let me just say a little bit more.

I think that Mrs. Gorsuch has been trapped by her own inept management to date in coming out with the statement that no more people were going to be fired. That means that they are counting on normal attrition to take care of the 12-percent personnel cut. Unfortunately, normal attrition is not going to eliminate the people in each area who should go to leave the 88 percent required to run the Agency.

There are Agency plans to make administrators into researchers and so on and so on.

This goes far beyond talking about any budget cuts. More important than dollar cuts are effectiveness cuts. They go far beyond dollar-term cuts. They are really much more a matter of management than they are of dollars.

Indeed, as an aside, as I went through the budget and talked with some of EPA's officers, I found myself beginning to rectify these budget numbers as if this were reality. That is not reality. They are simply the resources that enable the Agency to do the job that it wants to do.

If the personnel in the Agency want to go in some other direction, then those numbers don't necessarily represent any capacity.

I want to summarize two recent studies that I did. The first was coauthored by Gil Omenn and looked at the reauthorization of the Clean Air Act. In trying to apply the premises that I noted above, we thought that there were four essential roles that EPA had to take on. The first is the regulation of interstate transport of pollutants. Obviously, no one State can deal with that, unlike the case of water pollution where one can define the States through which the Ohio River flows so that you can get a commission together.

It is much more difficult to talk about where sulfur dioxide from a high stack is going to go and then to try and get those parties together, as we find in our negotiations with the Canadians.

May I add, parenthetically, the only real trickle down I know of is acid rain.

The second area that EPA has to get into is research and analysis. There is no reason in the world why 50 States, or even 5 States, ought to be going through looking at the health effects of air pollutants, looking at how it is you control pollution, and so on.

Obviously only one party needs to do the research. One could conceive of some coordinated effort that had 50 States doing a small piece of the puzzle. I don't believe that could ever work.

The third area is that EPA must keep hold of regulation of pollutants for health matters and regulation of pollution in class 1 areas.

Much can be turned over to the States, but I think those two have got to be controlled centrally.

The last area, I think, agrees with points that other people have made: EPA, must increase its control over monitoring. I have worked professionally and in my research capacity with data on air pollution from EPA. I can tell you that those data are worse than anything anybody has ever described to you.

We do not know, now, where we stand. We do not know area-by-area how much things have improved or not improved since EPA began. We have no ability to compare air pollution in one area

with another, despite the data that are quoted that attempt to do that.

Until we get some better handle on what is actually going on out there, our activities and attempts to regulate are based on guesses.

Let me give you an example from the book that Gil Omenn and I did. It turns out that, as contemplated originally by EPA, there were areas where no monitoring would go on, rural areas for example. If no monitoring went on, then obviously the regulation should be less stringent than for an area where monitoring went on and it was out of compliance.

We have 40 areas around the country that have simply shut off their monitors, thus becoming so-called unmonitored areas. By doing so, they would have required a lesser level of pollution control than when they monitored because they were out of compliance before.

That is only one of the kinds of examples that we get into with the really terrible monitoring that we have right now.

Another study that I conducted a while ago was a conference that Bob Crandall and I organized on the scientific basis of health and safety regulations. As has already been emphasized here, that basis is very thin. One of the reasons why I believe that much of EPA's R. & D. money has been wasted today is that it has had only the most marginal role in the decisions that EPA's has made.

Those decisions have been made largely on other grounds and the scientific evidence has largely been window dressing. This has come out because the administrators at EPA want certainties from the scientists. They want what Edmund Muskie characterized as some "one-armed scientists."

Well, there aren't any one-armed scientists. That's not the nature of the kinds of issues that EPA must deal with. We need better scientific information. We need to have administrators that understand the nature of scientific evidence and the fact that they are rarely, if ever, going to get certainty.

I think that it is going to take administrators who have worked with scientific information in the past and not people who have had quite different kinds of careers.

Some of the cuts that should not have been made include health effects research. I really think that this is a travesty.

Anyone who has looked at, for example, the review that went on for the ozone criteria document and the ozone national ambient air quality standards will know that the evidence supporting that revision was only of the most remote sort. Most of the evidence was simply a massaging of data which had been available when the original standard was set.

There had been very little which had gone on since then. I have inquired of EPA how much additional research is going to go on before the next revision must take place. And I must say I am not at all sanguine about that. The answer seems to be that on the order of $1 million to $2 million a year is going to be devoted to research on ozone effects.

Unfortunately, research in this area is extraordinarily expensive and what $1 million or $2 million gets is more massaging of the old data.

Obviously we need to have some new fresh looks here.

Is that an important social problem? Well, we are spending in excess of $10 billion a year on it. You would think that, perhaps, after 12 years we could begin to get some answers which would allow us to make some better decisions in the area. Unfortunately, we are not on that train.

An area where some cuts have been made which I think are probably good and probably not so good at the same time have to do with some of the engineering studies.

Here, some of the cuts have been made in areas that I think are entirely duplicative of private-sector efforts. For example, EPA should not be in the business of trying to demonstrate pollution control technology.

Many of the executives in the environmental controls industry tell me that they would like EPA out of this area. They would like to be able to do the development themselves, so they can get the patent and market their own products.

When EPA has gone through getting its own patents and then offering this technology on the market, frankly, no one is interested. You can't get a competitive edge in turning out that technology. Everybody will be doing it at that same time.

Not only that, but EPA is not particularly geared to be a direct contact with the users of that technology. It is just something that costs an enormous amount of money and is not very effective.

Where EPA should be putting its money is in much of the basic research concerning control technology. When you have a project which is 10 or more years off in the future, private industry is probably not going to put up the bucks to fund it. That takes some governmental organization.

But that does not require the enormous expenditures of demonstration projects.

Another area that I can testify to and this is mentioned by EPA, is in terms of some duplication of efforts. For example, one friend of mine was asked by yet the fourth agency to turn out a criteria document on benzene. He offered any one of the three documents he had already written and was informed they needed a fresh look, despite the fact there had been no fresh data since the first report.

Obviously, we need to have some better coordination and we need to have agencies and offices within agencies not going over old material again and again. They used to look at where the uncertainties are and to do something about resolving them.

The other point that has to be made here is that if we are going to continue to protect the environment and we cut down EPA's budget and its R. & D. budget in particular, then somebody else has to take over those functions.

They can be taken over by the States, but then we heard a while ago from Dr. Peterson that the States are probably not going to be able to do that. Or, they can be taken over by industry.

In some of these cases, these should be taken over by industry. I said some. One of the best examples of that is the Automobile Health Effects Institute, which is a cooperative industry-Government enterprise just getting off the ground.

One of the other grounds for looking at that is in terms of the TSCA and FIFRA legislation. Those are areas where companies

have to prove that their products are safe before they are allowed on the market. I think that is putting the shoe on the right foot.

Without trying to penalize industry, we ought to have them bring forth the data that say some new product can be presumed to be safe.

That takes vigorous enforcement of those statutes and I frankly see not the slightest evidence that EPA is enforcing TSCA and FIFRA nearly as aggressively as past administrations have.

There are a couple more points and then I'll stop.

One is that there is less in the EPA budget than meets the eye. What is really important is how well the Agency is run, not how many dollars you appropriate. You cannot force those dollars to be used well. As I look at the appropriations within the Agency, I must say I see what seem to be weak bureaucratic responses rather than hard-nosed looks at what must be done.

In-house research versus research grants was mentioned earlier. I see the cut in peer-reviewed research grants as a weak-kneed response to some squeaky wheels. I want to preserve EPA's scientific staff, too, but given that we are going to cut, I think that it is all the more important that the Agency put those dollars where they can be most fruitful.

I think that there is overwhelming evidence that those dollars are most fruitful in peer reviewed, competitive research, not in keeping in-house experts going even when their work is not necessarily good.

I think we need to retain a major in-house capability to do scientific research within EPA, but I can't imagine that that should be entirely at the expense of peer reviewed grants.

One of the problems that I have with the current EPA budget is that it seems to me to be based more on "a fair share" concept of budgeting. That is, how can we put cuts here and there and have everybody come out looking more or less as they did before. Instead, EPA should be looking at the decisions that must be made, the current uncertainties and where expenditures can reduce those uncertainties in an important way.

I have not seen that kind of rationale applied and I think that if the Reagan administration is serious in what it proposes, that is exactly the kind of rationale that we need.

To summarize, then, I applaud any serious look at EPA. I think it is overdue. But, I think rather than simply trying to look at dollars and budgets, we need to get behind that and look at what the major questions are facing EPA, how does the administration intend to try and answer the questions and then what sorts of funds are required for that.

I must say at the moment that I think that our efforts in talking about the budget are probaby not the central issues here. The issues have much more to do with what the Agency intends to do with its resources.

Thank you.

[The prepared statement of Dr. Lave follows:]

Testimony
of
Lester B. Lave
Brookings Institution

Subcommittee on Natural Resources, Agricultural Research and Environment

February 24, 1982

There are a few premises that underlie my testimony and that I believe we share. The first is that we desire protection of the environment and particularly desire that the environment nowhere be degraded to the point where significant adverse health effects result. The second is that private and governmental actions be based on the best available scientific data and that research be supported to resolve current uncertainties. The third is that federal agencies ought to stay out of areas where state and local governments are doing an adequate job; most especially, the federal government ought to stay out of areas where private economic and other institutions are functioning well and are capable of resolving the problems. The fourth is that, in this time of budget stringency, great care must be taken to allocate scarce funds carefully and to eliminate duplication and waste. The fifth is the lesson learned over the last decade that environmental issues are extremely complicated; the solutions are often contrary to intuition.

The time is long overdue for a careful reconsideration of the EPA research budgets. Other EPA expenditures, such as those for sewage treatment have been ineffective. We have all spent too much time

comparing EPA's budget to our desires for progress, without examining whether the funds were being used productively and whether there were cheaper, less obtrusive, or more effective means of dealing with the problems. The answer is yes sufficiently often that large cuts could be made to the EPA budget generally and to the ORD budget in particular. Often, these do not seem to be the cuts proposed by the Administration.

While some cuts can be justified, the 1983 budget request is only about half (55 percent) of what the 1981 budget was in constant dollars. It implies a flagrant disregard for environmental protection, my first premise. Since I do not have the details of the administration's program, I will indicate areas where I think expenditure cuts can be made and management improved.

In a recent book on the Clean Air Act, Gilbert Omenn and I described a number of ways in which cleaner air could be achieved more effectively, while lowering the overall cost of the program.[1] We suggested that the goals of the program be restated to include consideration of both social benefits and costs, that the current responsiblity of states be recognized by giving them responsibility for setting "secondary" ambient air quality standards and allowing EPA only a limited amount of time to demure on each state's implementation plan,

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1. Lester B. Lave and Gilbert S. Omenn, Clearing the Air: Reforming the Clean Air Act (Washington, D.C. The Brookings Institution, 1981).

that EPA focus its efforts on monitoring, setting primary air quality standards, and on such interstate pollution problems as acid rain. We also suggested that much of the expenditures on air pollution control have been wasted, particularly expenditures for automobile control and that new regulations could lead to more effective control at much lower cost.

These recommendations recognize the goals of President Reagan's new federalism and attempt to delegate to states all the tasks that are not clearly performed better at the federal level. The major categories of programs that should remain with EPA are: (1) interstate transport, (2) research and analysis, (3) protection of health and Class I areas, and (4) monitoring. By definition, a multistate authority is needed to handle interstate transport of pollutions. Research and analysis need be done only once; it is wasteful to have fifty or even five states carry out the same research. Protection of health and Class I areas is deemed to be such an important national issue that the setting of standards is left to EPA; implementation of these standards would rest largely with the states through their SIPs. Monitoring is a federal responsibility since, without good quality control, there is no way of knowing current air quality in each region, whether a region is getting better or worse over time, or how regions compare.

In a conference at the Brookings Institution two years ago, Robert Crandall and I found that the scientific basis of health and safety regulation was thin.[2] This was especially true for EPA air and

water regulation and resulted from several causes. The first is that few scientists could tolerate or sympathize with the chaotic, pressured environment of a regulatory agency. Consequently, few good scientists were willing to learn the rules of this new environment; virtually all preferred to stay at their labs doing research and hoping that somehow their results would be fed into the regulatory process. More often than not, this research was bent out of shape by regulators and their opponents, with little science emerging from the controversy.

For example, the EPA air program has concentrated on classifying studies as flawed or useful, with the clear implication that flawed studies have nothing to contribute to the regulatory process. No more unscientific attitude can be imagined. There are no perfect studies, and there is a vast amount to be learned from flawed studies. What we know about the effects of air pollution comes from a vast literature of flawed studies. The legal-regulatory mentality has led EPA to an approach which is self defeating. Having thrown away all but a handful of studies as being flawed, they do not seem to have realized that even the remaining studies can be attacked for their flaws so that no basis remains for scientific judgments. By attempting to summarize the literature in a legal-regulatory framework, EPA is violating the process used by scientists to examine what is known.

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2. Robert W. Crandall and Lester B. Lave, The Scientific Basis of Health and Safety Regulation (Washington, D.C.: The Brookings Institution, 1981).

The Crandall-Lave conclusions that there is little science in regulatory decisions has been widely quoted, particularly by the business press. Most reports neglected to report our conclusion, however, that much more science should be brought to bear on regulatory decisions. This has not been done because it would require recognizing the limits of what scientists have to contribute, taking this contribution more seriously relative to legal issues, and restructuring agency management and decision-making.

EPA's expenditures on research, particularly health research, have largely been wasted; they have largely been window dressing for decisions made on other grounds. Indeed, the role of the research seems to have been structured to minimize the chance that results would constrain EPA decisions. When budgets get tight, agencies naturally jetison the least essential aspects. It is revealing, and thoroughly consistent with these observations, that large ORD cuts have been in health effects research.

With these cuts, EPA has ensured that the bad past practice would be institutionalized. Five year reviews of National Ambient Air Quality Standards have been a charade, massaging old data rather than resolving the most important uncertainties. While EPA recognizes this difficulty, the budget cuts make the situation worse.

We are spending more on air and water pollution abatement than all other public health programs combined. Yet, virtually everyone agrees that the wrong pollutants are being regulated, or at least that the pollutants being regulated are only a surrogate for those harming

health. For example, EPA regulates total suspended particulate matter (TSP), while this measure is almost totally due to particles so large that they cannot get into the lower airways. It is small or respirable particles that should be regulated, not TSP. Vast amounts are being spent, inefficiently, to regulate smog. Yet, the ozone standard appears to have little basis in health effects. Furthermore, the whole policy of extremely stringent emissions standards on new cars is fundamentally flawed and probably pernicious.

Many of the savings in the health effects area come from assuming that a program can be carried out by some other agency and either eliminating it or reducing it severely. In the best of times, the 1981 budget allowed other agencies to take over some of the burden. The current budget puts so much pressure on other agencies that there simply are not the resources to take on these additional tasks. We should recognize these cuts for what they are: Eliminating many research programs and vastly reducing others. This is the wrong decision.

Another major class of savings comes from curtailing engineering work, such as that for toxic wastes. While major savings are possible in these programs, the elimination of the engineering work means that the programs are going to become more and more out of date, particularly in the fast moving area of control technologies. What is needed is a refocusing of the effort to keep within EPA those activities that EPA need do and to eliminate those activities that control equipment and engineering firms can do better.

Many federal agencies, state agencies, and industrial groups are conducting research on the effects of pollutants. In many cases, even among federal agencies, there is enormous duplication and waste. For example, substances like formaldihyde and benzene have been regulated or regulation has been proposed by a number of agencies. In each case, little reliance has been placed on the work already done. The Health Effects Institute provides a good model of cooperative government industry research on automobile emissions. I am opposed to government reorganization, which is enormously costly, or to requiring that all private and government efforts be centralized. However, by giving more attention and impetus to coordination and cooperation, much waste can be eliminated.

Just as it is wasteful to have fifty different states each eliminating costs and benefits, so it is wasteful not to give attention and resources to disseminating information to states and to learning from them what questions they deem most important. According to a National Academy of Sciences study of research and development, far too little attention and resources are given to disseminating research results.

EPA has cut its research grants program from $19 to $13 million, with all future research concentrated in EPA labs. This seems to be a weak, bureaucratic response to squeaky wheels rather than a hard nosed look at where funds can be most effective. For a host of reasons, peer reviewed, competitive research makes a more effective use of research dollars than inhouse labs. The former need not support investigators

during slack periods or when their ideas are not good. Often, the university or other institution is willing to pick up some of the costs, at least the costs of supporting researchers when they are not otherwise occupied.

I have testified previously that government agencies need some inhouse scientists. They are required to give some science advice, interpret the literature, design and monitor research programs, and generally represent the intellectual paradigm of science. Good scientists cannot be recruited without an opportunity to continue their research. However, I see no need to have a larger inhouse program that is required to have sufficient scientists to fulfill the above functions. The rest of the funds should be allocated on a peer reviewed basis.

These are, I believe, the central tasks for a federal EPA. Note that research is prominent. Without good information, good decisions are virtually impossible. Whether decisions are made at the federal or state level, they must be made in light of the health and other effects of various levels of air (and other media) quality and in light of the costs of achieving them.

The current budget has more superficial appeal than substance. For example, the cuts in the toxic substances program are justified by noting that the background work was completed and the rest is up to industry. However, final regulations are largely unpromulgated. Thus, no one is taking any action, and cannot take any action until final regulations are in place.

A key issue here is how much of the costs are to be borne by EPA, how much by states, and how much by the private sector. It is all too clear that the states cannot shoulder a great deal more. Thus, cutting the federal budget means shifting more of the burden to the private sector, or decreasing environmental protection. For pollution control equipment, shifts to the private sector would be an improvement. Still more shifting can by done under TSCA and other statutes that force industry to produce the evidence of safety. If EPA administered these statutes aggressively, it could reduce its own research funding significantly. However, there is no indication that EPA is administering these statutes as aggressively as either Congress intended or as they has been previously.

The budget and my conversations with EPA personnel reveal that they are aware of many of the points that I have made. Funds are allocated for such tasks as preparing for the next review of the ozone standard. However, the first point is that $1 or $2 million per year does not buy much research. This is especially true for health effects. Rather than using a "fair share" criterion for budget allocation, EPA must begin with the current state of knowledge, isolate which uncertainties have the greatest effect on current and near term decisions, and then estimate how much it would cost to reduce the uncertainties significantly by the decision date. This approach will result in many research questions being pushed aside as being of less significance. However, it will enhance the quality of information available to EPA administrators at the time they must make decisions.

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A corollary is that allocation of funds within programs must be on the basis of enlightening decisions, not ease of contracting or seeming to be responsive to current crises. Better decisions in environmental protection require better information. No amount of reexamination of old studies can do much to enlighten current decisions.

The key to more effective environmental protection is better management of EPA. Uncertainties must be resolved and analysis focused on the key decisions. Glib statements of generalities are not substitutes for detailed knowledge of issues, tradeoffs, and what available technologies and control programs can accomplish. I do not believe this budget is responsive to EPA's mandated tasks. If society is serious about environmental protection, we must find more resources and a better management plan.

Mr. WALGREN. Thank you very much, Dr. Lave. That was a sound presentation.

If I might ask one opening question, and then turn to Mrs. Schneider or Mr. Carney.

It is kind of like an onion. You want to peel it open. We are so limited in our ability to control and even evaluate from the congressional level what goes on in an Agency when you hear a range of testimony that really has to do with management, it is really frustrating.

What I would like to do is find out if you were in our position, and the first question you had to answer was what is the dollar number that you are going to allocate to this function this year—and I understand that we are all frustrated by the management and the difficulties that are faced in that problem area. How would you set that dollar number? We almost have to go to an overall dollar number first, as kind of a macroallotment of our efforts if such could be said and then, hopefully, with good will and good people.

You approach doing as well with that money as you can, but how would you set that overall dollar if you were the president of a company distributing your dollars among these functions this year?

Dr. HAUN. From the standpoint of having been an industrial research director, and having been through this feedback process many times, it is a very frustrating task for a chief executive officer because, generally speaking, what happens is somebody comes forward with the type of figures that you have been given—which, incidentally, I didn't get to see until today so I am a little bit ignorant on the figures themselves.

That is usually built up from the bottom—the list of projects, the list of staff, continuing requirements, very much like I am sure this budget has been built. Then the CED is sort of faced with the question, well, in view of the business climate that I have ahead of me, how much can I afford to spend.

And, it is routine in most companies for a slash to come back, and to say, we can't afford that much. Rarely it will come back to the issue: "We are not doing enough, tell us how we can effectively spend more."

But, I don't think there is any formula, Congressman, that will work.

Zero-based budgeting is the best approach if you can find a way to do that. It is also a very difficult approach because there are so many fixed expenses in a research program, or semifixed expenses—the support troops, the space, the utilities, the supplies—all those sorts of things that really aren't a function of how much effective work you do. You use them whether you do effective work or not.

Mr. WALGREN. Are there other reactions?

Dr. JOHNSON. I think that the interaction between the "customer" and the generator of the research information is a key factor. And, that is very difficult.

Understanding the research process in EPA by their constituents is very difficult indeed. I don't think we can do anything about that very soon. One thing that I think we can start to do is to decide where you want EPA truly to be primary.

Take health effects, for example. This is a basket term, health effects research. I mention this because I did serve on the committee looking into it. You see a wide variety of activity, all the way from toxicology, respiratory toxicology, analytical measurement, epidemiology. All these types of activities come under what is called health effects research.

I think it is meaningless to look at health effects research without putting the "microscope" on these various parts and then deciding where EPA should be primary, or the National Cancer Institute primary, or the Bureau of Standards primary in their particular area.

That step in the process of prioritization, I think, is key and I think there should be substantial agreement. When you look at a line item in the budget, it may not be descriptive, we need to understand it. I don't see how you could quickly do that. This is a tortuous process.

Mr. WALGREN. Thank you.

Dr. Dowd?

Dr. DOWD. Let me take a crack at this just briefly.

I think that when one has such a major difference of opinion—you have had presented here testimony that goes to $640 million for EPA's R. & D. budget. The administration clearly thinks that $216 is sufficient. You have heard me say something on the order of fiscal year 1982 or 1981 numbers.

It seems to me that under those circumstances, what you need to do is try to figure out which strategy will limit the damage should there be a mistake made. It seems to me under the circumstances that, at least for the very short term, pending a careful look at role

and objective as everyone here really has mentioned, that the damaging, limiting function is to avoid massive reductions, both—as I said in my statement because it is of very great concern to me—to avoid the reduction in extramural funds. I very strongly feel that the core of scientists in the country who are outside of the Federal Establishment are critical to the understanding of environmental issues, as well as having some people in the Agency who truly understand the scientific issues.

It seems to me that if you approach it from that standpoint, then you say we want to hold, at least for the moment, pending a real look, as Dr. Lave said, at what the EPA research program should be.

Second, you asked the question that both Dr. Lave and Dr. Johnson were talking about, in terms of what Congressman Brown's article 6 months or so said—which areas of leadership should the Agency take. I think that is the question of primacy. Where should the Agency be a leader?

I think in today's testimony, you certainly came up with a couple that almost everyone here agreed on. First, the whole area of ecological effects. There is no other agency that has the ecological and health effects, let's say, of environmental stresses. There is no other agency that has that kind of mandate.

And, second, monitoring. But, monitoring raises yet another problem for this committee that is an organizational one. Most of the monitoring that is done by the Agency goes to other committees. It isn't under the research and development program, an issue, incidentally, that I think was a mistake when the Agency made that change in 1972.

Mr. WALGREN. But the quality of monitoring as I understand it—the development of effective measurements—would be directly related to the research budget. Is that correct?

Dr. DOWD. That's right. But, in fact, in 1972 when monitoring was split from what then was the Office of Research and Monitoring to each of the program offices, although at that that time that remaining office, ORD, maintained official responsibility for quality assurance and methods development, what happened in practice was that each individual program had its own turf.

"We have the water monitoring." "We have the air monitoring." And the result of that is then, I think, a fairly great dissipation of efforts.

If you can find a way to reinstitute, which in fact they tried over the last administration, and I think this administration does not disagree with that, try to make sure that you have encouragement to providing real authority for the Office of Research and Development—it could be another office, but certainly that one—for maintaining quality of monitoring data, methods, et cetera.

This is not just for what the Agency does but for what the clients, the States, do.

I think that is how one might go about trying to establish it. I don't have a specific answer. I have my own personal opinions, but your problem is how do you deal with the Committee with this.

Mr. WALGREN. Dr. Lave?

Dr. LAVE. Let me say something very briefly about it. I can recommend some areas in the budget where I think further cutting

could be done. It is almost impossible to look at the budget and say where funding should be increased because that increase has to be built from the bottom up.

If you throw money at EPA, about all you can do is to make sure that people will not be fired. You can't force the Administrator to use the moneys as you might want to have them used.

And, if you talk about damage limitation, as Dr. Dowd did, then perhaps all you can do is stop any further firing of the staff. Much more than that that is required. The frustration of dealing with it at this end is having a concrete proposal from EPA allows you to look at it and say, "we think there is too much in this area," or "this can be cut."

To go back and say, "No, we want more cuts in this area," doesn't require detailed knowledge. If you appropriate moneys that weren't requested, then you are really throwing yourself on their hands and saying we hope you will use the money wisely.

Dr. HAUN. If I may, Mr. Chairman, there is another problem. Here, in this city, there are over a hundred agencies that have environmental somewhere in their name. A significant number of them are conducting what they think is research of one kind or another. They are buried within the cabinet agencies, Senate agencies, the National Institute of Environmental Health Sciences—these don't feel as if they need to respond to the EPA's needs and vice-versa.

Just the coordination of this effort and the decision that if you push in the balloon here, does it bulge out somewhere else or does the whole balloon collapse. This seems to be a very difficult problem, but one which the Congress might well consider as the turf of this subcommittee to try to pull this situation together.

The totals are far more than the amounts of money that have been quoted here.

Mr. WALGREN. I have abused my time. Perhaps if there is a way you can get your point in in response to Mrs. Schneider, it will fit.

Mrs. SCHNEIDER. Thank you for your consideration.

I would like to pick up on a point that Dr. Lave and you were just making.

Dr. Lave, I wonder if you can sincerely say that there are no priorities that have been established by EPA as yet. You gentlemen were talking about primary R. & D. efforts, what should be our top priorities.

I think that that is very clear by looking at the EPA budget. I can tell you right now that if the EPA intends to cut 55 percent of their budget from Superfund, that that is not a priority.

If they intend to cut 39 percent of the budget in water quality, that is not a priority.

And, when the indications are that intentions are to cut 34 percent from energy impact, those are not prioritites. I think they have very clearly stated by looking at the numbers and where they are to be spent, there is a slight increase in acid rain research.

But, I have to tell you that sitting on this committee which has some jurisdiction over acid rain, it seems to me that, yes, there is room for additional acid rain research. Yet, this is the top priority for research and development at EPA, when in fact we have had scientists from not only across this county but throughout the

world come and testify here and tell us granted, we need more research. However, it is imperative that we begin mitigating measures at this moment, before this problem becomes more severe.

So, I don't agree with you at all that EPA in not setting priorities. I think that their priorities, though veiled, are quite clear in this budget.

Dr. LAVE. I'm sorry. I did not mean to imply that they are not setting priorities. Part of what is interesting about this EPA budget document is that if one reads it through, there is not an awful lot in the priority setting that they have here that I disagree with.

They have increased some things. They have decreased other things, vastly, and so on. As I read through that, it seems to me that it makes a lot of sense.

In my discussions with EPA people, the level of what they were talking about here, in general, made sense. That is, if you looked at what was being cut most, those are the things that I would probably cut most. And, those things that were being relatively cut less, I would probably have cut less.

The problem is that some cuts waste money. TSCA is designed to get private companies to establish the safety of their products before they are marketed. EPA has yet to learn how to use this statute effectively. The current budget does not address the right concerns. Saying that we are cutting less than elsewhere in an area that needed to have a vast increase in funding doesn't seem to be responsive.

But, the other part is that, again, as I found my self in this conversation doing, we should not reify these budget numbers. We want to talk about what the Agency is doing with these and that's really where my fundamental criticism came in.

Mrs. SCHNEIDER. I would like to follow up on that point because that was another comment that you made, that we cannot force the money to be used well at EPA. In other words, you made some reference to a weak bureaucratic response, and the discussion has come about indicating that we are losing some of the best scientists at the EPA under this current administration.

What would be your recommendation?

Dr. LAVE. Can I just give a slightly broader answer. One of the questions asked Dr. Peterson was whether he thought EPA should be an independent agency and he sketched out something that would be completely independent of the administration.

I am opposed to that. I think that the overall problem in this country is that the bureaucracy is too little, not to much, responsive to each administration. Sometimes that means you are going to take your lumps, that is, you are going to disagree with what the administration is doing. But, after all, the President is elected and the head of EPA is not—nor is the head of any independent agency.

I would rather have more responsive government even if it sometimes does things I don't agree with. I would guess at this point that Congress should be in the midst of damage limitation and of trying to be responsive insofar as it can be to the desires of the administration in the environmental area. By appropriating money right now, you could make sure that there are not 12 percent or more cuts in personnel at EPA.

You could probably force some funds to be put into peer-reviewed research, some outside research. The personnel is all there to administer it. But, aside from that, it is up to the administration. I think that the administration will go through, present its program and we will have a mandate on that. We will probably have a mandate in November. At least we will have some elections that, in part, will turn on that.

And we will have another one in 1984. We will see.

Mrs. SCHNEIDER. Thank you.

Dr. DOWD. Let me just mention one thing. It is not really quite true that the Congress is unable to get the Agency to do research that it is asked. I can think of three specific examples in which the Congress has asked the EPA in the past and it has done it, with various levels of success.

The Congress asked the Agency to carry out a Great Lakes research program. Now, it has been cut, but indeed the Agency was carrying out one for considerable period of time.

Congress asked the Agency to carry out a Chesapeake Bay research program, now cut, but indeed probably one of those that was most successful in terms of trying to look at the Chesapeake Bay.

And, the Congress asked the Agency to carry out a special air pollution research program in Houston, probably the least successful of the three I have mentioned in what the Congress asked the Agency to do. But, it was clear that in each case that the Congress, when it put that in the authorizing legislation did not know the specific details but knew pretty well what it thought the Agency ought to do, it did so and, in fact, the Agency carried out such a program.

So, on the one hand, that only is an occasional kind of change. But, it can be done.

Mrs. SCHNEIDER. For the sake of saving time, I would like to request that Dr. Lave submit for the record some specifics that will tell us where EPA money has been wasted. I think that it is important for us as investigators and overseers to make sure that they don't.

I, for one, would like to be well-informed as to where they have wasted money in the past.

So, if you would please submit that for the record.

The other question I would like to ask of Dr. Haun and Dr. Johnson. I think your testimony was most impressive. Your suggestions are that industry work more closely with Government. About 2 months ago, we had a full committee hearing of Science and Technology. The Administrator of the Environmental Protection Agency came before us. There was a very critical question that was being raised as to making determinations dealing with formaldehyde. Of course, there was a great deal of criticism there because the Agency chose to meet only with the Formaldehyde Instititute and not with independent or university researchers in this area.

If I were to go before my constituents and recommend that industry and Government work together in the area of research and development, what do you think would be the response?

Dr. HAUN. I don't know how to predict that. I have spent the good part of the last 10 years trying to build some working rela-

tionship between Government and industry in this area. The atmosphere of suspicion, particularly the legislative barriers such as the Advisory Committee Act and all of the ex parte contact decisions of the courts and so forth make this essentially impossible, except in an atmosphere in which everybody is making a speech instead of having a conversation.

I think that is very unfortunate and that we ought to find some mechanism within which trust can begin to exist.

I can't let it pass, and I think it bears on this question. Dr. Peterson indicated that he thought that industry was losing its interest in environmental control because of some perception of this administration's point of view.

Believe me, of the hundreds of people that I know who actually administer control programs in corporations, not one would agree with that statement in my judgment. We are having to sometimes fight off our top management who are reading this in the papers and think they should be taking this point of view. We keep telling them, "no. That's not true on the firing line."

We have not known of an enforcement action being dropped. We don't know of any such situation occurring. We are moving forward. Furthermore, it is institutionalized within our companies today in a way that it was not 10-years ago.

Mention was made of the Japanese situation. I worked in Japan. I built three plants for my company in Japan. It is just incredible the different relationship one has with any Government agency there. You are actually encouraged to sit down and negotiate a solution to the problem and not in a public forum with all other kinds of individuals. Maybe that's not right, but that's the way it is.

Mrs. SCHNEIDER. I do agree with you that our current situation is extremely frustrating, because I share with you the understanding that industry has moved a great deal partially because of their own initiative, partially on the initiative of the Federal Government toward improving their environmental awareness.

However, the perception is, and I think that if you were to look at a poll right now which asked is the Reagan administration in bed with industry, I can guarantee you what the response would be, because that is the kind of mail that I am getting and those are the kinds of articles and editorials that you are reading out there.

We have to deal with reality and with what the perceptions are.

I had the good fortune to travel to Japan on this very issue and others, and to meet with the U.S. Chamber of Commerce in Japan to discuss it with them. I think much of the role can be played by us as leaders, but also by you as industrial leaders, is to promote that educational level. In Japan, they work on consensus and as a team.

Here, we work through confrontation. Industry has had the reputation of trying to work their way around all of the laws that we have implemented. This is a new age now, I believe, and a new age of industrial awareness to a great degree for those industries that can afford it. There are many of those that can't, so they try to get away with pollution.

But, I think an initiative on your part is just waiting to happen. I would be the first to encourage and work toward that goal of com-

munications with Government, industry and consumers so that, as one of you suggested in your testimony, perhaps we should have legislation that would mandate cooperative arrangements between industry and Government in the area of research.

That is a great idea, but I think we would have to have a consumer element there, also, especially if we were to implement such a thing at this date. That credibility has not improved enough as yet to make it something that would pass.

Dr. JOHNSON. If I were talking to your constituents, I would certainly point out the Japanese and the benefits of cooperation.

Another suggestion is a book that might be of interest to you by Milton Wessel called "Science and Conscience." He is an attorney who has done a lot of work on this very problem of consensus development in socioscientific issues. He points out the problems of the adversary system in the book rather skillfully, I think, and he demonstrates some ways and approaches.

Being from Dow, which is quite a high-profile company, I have been especially sensitive to this problem, when I serve on committees. I think two things are helpful. One, is to make it open. I think that consumers or activists that have different points of view should have the opportunity to see and hear what is going on especially if they have the scientific competence to participate. The most beautiful common ground for all of us is good science—Government, industry or the consumer. I think we ought to work toward that and do it in the open.

Mrs. SCHNEIDER. Just one final thing I would like to mention that none of you brought up but which I think is critically important. Coming from the State of Rhode Island, and many of my constituents are members of NAM, the smaller businesses and industries have a tremendously difficult time trying to find the capital to provide the pollution control equipment that is so very necessary. Some of them have really gone out on a limb to make those improvements.

Needless to say, they are still enthusiastic about it, but there is a real problem in getting information generated from this hall to the field in so far as what technologies are available in terms of pollution control. It seems to me that that would be a role that would be very important for the Environmental Protection Agency, at least to act as a clearing house, so that the public and especially small businesses might have some kind of information as to number one, the technologies and number two, their cost effectiveness.

Who could we see doing that sort of thing?

Dr. HAUN. There is a function in EPA called a technology transfer function. It publishes a bulletin once a month, holds conferences and seminars. Unfortunately, small business does not have the time. The managers of small businesses do not have the time to attend those things.

I think the effort is well-intended. Many of their publications are of good quality, but they are not reaching the people that they need to reach many times. Really, the only hope the small businessman has is the competent private consultant.

Mrs. SCHNEIDER. And, that, too, adds to his overhead.

Dr. HAUN. That's right.

Mrs. SCHNEIDER. Thank you very much, Mr. Chairman.

Mr. WALGREN. Thank you, Mrs. Schneider.

Mr. Carney?

Mr. CARNEY. Thank you, Mr. Chairman.

Gentlemen, I assume you have all had an opportunity to see the EPA R. & D. budget. Is that correct?

Dr. JOHNSON. I did not until today, sir.

Mr. CARNEY. Mr. Johnson, you did not.

Mr. Lave, how much time and into what depth was the budget that you received? Did you just receive the line item?

Dr. LAVE. I personally spent time talking with two of the assistant administrators at EPA about the budget, particularly the R. & D. budget. So, I have heard their arguments about what they are doing and why and have spent probably a day looking at this EPA budget material.

Mr. CARNEY. Dr. Dowd?

Dr. DOWD. I was able to read the summary of the budget material and I also had the opportunity to look over the weekend at the appropriations submission to Congress which had somewhat more detail. But, I must say I fell asleep several times.

Mr. CARNEY. The point is that we have not had any opportunity either to get into this budget because EPA has not been out here stating their case. Traditionally, the Agency would come down and state their case. Witnesses such as yourselves would come in and give a pro or a con report to what they have presented.

I think we have a problem here where we have the cart before the horse, and we are all running around saying we should do this, we should do that. I don't understand totally the justifications of what EPA is doing because they have not had their day in court.

Our first witness threw figures around. I don't know how he put it together. I asked him, "Do you have line items? Have you sat down and looked? Should you put this into health sciences, or what?"

He said, "Oh, no. Just three times what it is right now." That was a nice round number.

We are doing something wrong here. We should have the situation turned about, and then we could perhaps hear from everyone as to what you think their priorities are. I think Dr. Lave pointed out that we are looking at the wrong thing. Congress has to determine, to an extent, where we would like the Agency to go.

The administration has to make that determination. Then we have to play the devil's advocate to make sure that we are carrying that out.

We hear Dr. Dowd say he would like to see 1981 levels. Dr. Lave, you are talking about 1977. I have a question. Do you think that in 1981, Dr. Dowd, they were adequately funded?

Dr. DOWD. I guess the answer I would give would really be a combination of what you have heard already. There is certainly, in any kind of budget that the EPA has, fat that can be sweated out. I would be the last person in the world to say that that isn't the case.

But, I think that there are selected areas that the 1981 budget was not adequate. For example, I think the 1981 budget in acid rain was not appropriate. I think there are some areas of the noncarcinogenic end points of health effects where it was not adequate.

As I believe I mentioned to this committee a year ago, when I appeared in a slightly different guise, that I think we have paid much too much attention to the environmental causes of cancer and haven't looked at environmental causes of human health end points that are a very serious significant problem.

Dr. Lave's comments on air pollution research are absolutely to the point. The 1981 budget for clinical studies of health effects of conventional air pollution was not sufficient, nor is it today in my view. But, generally, I guess what I was focusing on was how can one at least stop a reduction of some of those areas that are major.

That was my reaction. I think that there are some areas that are not adequate in 1981. That's absolutely true.

Mr. CARNEY. I can appreciate what you are saying, in as much as there are areas that were and areas that were not adequately funded for what their role would be.

I have heard 1977 used as a baseline. I haven't figured that out, but to my surprise, I had an opportunity to talk to Dr. Hernandez yesterday, very briefly. And he was using 1977. I was wondering why both sides of the argument have come to the conclusion that 1977 was the level year we should look at.

The point I was trying to bring out though is—let's assume that back in the 1970's when EPA was encouraged to grow and when the administration supported it and the Congress supported it, when there were not these budget struggles, when they could come down and write a blueprint and Congress would normally say, "that looks good" . . . in fact, Congress did add the Clean Air Act, the Safe Drinking Water Act that increased EPA expenditures. In the decade of the 1970's, was there enough money spent?

Dr. LAVE. Let me try that one.

The only way I can answer that question is to look at what sorts of issues EPA was trying to deal with, whether they were on a long-term path which would get answers to those issues so that they could make better informed decisions when they had to make them. I think that there were vast amounts of money that were being wasted in the 1970's, or the 1977 budget if you want to be particular.

Much of the health effects money was being wasted because it was not being focused on the issues that they needed to get answers to. Rather, they were massaging old data instead of doing better studies.

Rather than trying to grope for some number, I think we need to go through what was just referred to as a zero-based budgeting exercise to look at the mission that Congress has given the Agency, to then take a look at where the uncertainties are and what it is that we need to know. I don't have any feeling in my gut that if we don't spend half a billion dollars a year on research that it is too little.

I think we have to go through this exercise point by point. Again, this is a period of stringent budgets and rather than saying it is appropriate to have half a billion dollars in EPA R. & D., I think we have to look at what the questions are and where we can get some better answers to those questions.

Mr. CARNEY. Dr. Lave, I thank you because you probably saved me 15 minutes. I was buildling myself up to that conclusion by asking the panel the questions.

When the Congress felt they were and when the administration felt they were, and when EPA, themselves, felt that they were getting adequate funding, they did, at best, an appalling job with the moneys they had. We have to look at it and find out why.

I was going to ask other questions. Dr. Lave, maybe you might have an advantage on the question I was going to ask. In these cuts, how many of them are—as I heard the expression "belly to the desk cuts," as opposed to maybe GS–16's that have been running around in the building as administrators not really doing much but massaging old data and not coming up with anything?

I haven't had that opportunity to answer those questions because we haven't had EPA up here. That is unfortunate and I don't know why this has happened in this Congress.

Dr. LAVE. Let me reply to that rather briefly. The problem is that we don't live in a world where we can go into EPA and say, "you are not doing a good job? Out." We have to RIF within EPA. When you start riffing within EPA then, of course, then you——

Mr. CARNEY. The good and the bad go.

Dr. LAVE. What principally happens is that people start bumping one another. There is a story about a part of HHS where 10 percent of the people were fired and 80 percent of the people changed jobs. Now, surely, that is a recipe for disaster within an agency.

Mr. CARNEY. That goes before another committee.

Dr. LAVE. I'm afraid that what would happen if we reduced EPA personnel by 12 percent as is envisaged in the budget, is you are going to get all these square pegs in round holes. The Agency will be totally ineffective because you will have all these people doing functions that they don't know how to do.

I don't know quite how to stop the sliding of the Agency. I think that there is much that EPA did in the past that was not responsive to the kind of mandate you had. One of the things that I really hoped when this administration came in was that they had the philosophy of trying to look very hard at each of the agencies and not talk about motherhood and apple pie, but really ask what were the issues here and how could we deal with them.

I think that there has been some attempt on the part of the EPA Administrator to do that. But, I find the consideraton completely divorced from what is going on once you get down below the political appointee. I think that they are beginning to look in the right areas.

Basically, I agree with the general priorities in the budget. But, they need more money. I am afraid that they are not in touch with the realities of how those programs are actually being carried out.

Mr. CARNEY. What we have to do is use zero-based budgeting. We also have to start on the bottom rung of the ladder in determining the course of where EPA will go in determining its proper role and hopefully, we can do that.

It is rather frustrating. We are jammed into a very short timeframe to accomplish this. I'm sure others on this subcommittee have the same problems. My other subcommittee meets at the identical time, that this subcommittee meets.

It is rather frustrating. You are just painting everything with a brush and running it in and out hoping you are covering your bases. But, we are just going to go onward and upward.

I only wish EPA had their opportunity to come in here and defend their cuts. They look like they are horrendous cuts to me when I look at numbers. But, they might very well be justified. They might very well not be justified. But, I think we should have had that so I could have said, "Dr. Lave, what do you think about what Dr. Hernandez said? He said we don't need that. Do you feel that way, Dr. Dowd?"

We might have accomplished something. Here, we are in a bad situation.

Dr. HAUN. Let me say that the country would be well served if Research Triangle Park were at the same prestige level as the Argonne National Laboratory or the Oak Ridge National Laboratory.

Mr. CARNEY. I would have wished you had said the Brookhaven National Laboratory.

Dr. DOWD. I will throw Brookhaven in, gratis.

Mr. CARNEY. Thank you. I yield back to the Chair.

Mr. WALGREN. Thank you very much. Is there anything further?

Mrs. SCHNEIDER. I have just one last quick question for the gentlemen who represent industry. Mr. Lave had earlier made a statement that perhaps some activities could be taken over by States, perhaps some taken over by industry.

How realistic do you think that will be? I think that we are asking industry to take over a broad spectrum of things, everything from the Superfund to clean up toxic waste to carrying the burden of many different social programs and doing their charitable contributions to support the arts and the humanities. I am just really curious as to how you think that would work.

Dr. JOHNSON. I think it is entirely reasonable to ask industry to bear the cost of establishing the safety of their products to meet the standards. Those standards could be established by the governmental processes. The cost of developing those standards, however, probably should be the Government's duty.

Mrs. SCHNEIDER. OK.

Dr. JOHNSON. But, as much as possible, I think industry should bear the cost and that's the place it should go. The cost can flow through to the consumer. I see no reason for that to be levied as a tax.

Second, I would like to say that there are certain types of work included in the EPA budget such as synfuels. There is a big chunk of this energy money, as I understand it—not having studied all the lines of this budget—that has to do with synfuel processing, methods of generating fuels where it isn't truly known yet what pollutants are going to get out into the environment.

Is this really of consequence to the environment until it gets out? Until we know what the process is, we don't know what pollutants might escape. So, I think it is important that industry pick up a role in establishing the chemical processing technology.

When it comes to waste disposal technology, particularly with the new products, this should be part of the cost of development. With older products, where we are catching up, it may require cooperation and support.

An example of our industry initiative is the Chemical Industry Institute of Toxicology. The chemical industry formed a consortium to support toxicological research of a quality best in the land. CIIT could stand shoulder to shoulder with the best Government or university laboratory as far as quality is concerned.

Ultimately, I think that that cost of the CIIT approach is going to be less than having the studies done in a Federal laboratory. So there is a lot that can be done to encourage initiatives by industry.

Dr. HAUN. I think it is fair to say that no State, or a rare State, will be equipped to undertake these kinds of programs. But, I certainly agree with Dr. Johnson that it seems to me the synfuel people when they come forward with the feasibility of their process must know what its environmental impacts are and what they have to do to mitigate them.

The structure of TSCA clearly says that the administrator decides what tests should be run. The industry runs the test and brings the data back under proper quality control conditions.

There is no issue, here, of the Federal Government doing research on new chemical products under TOSCA. That is clearly the job of the proposer, not the Government.

Mr. WALGREN. Mr. Carney.

Mr. CARNEY. If I may? I did say about how we were conducting these hearings and I forgot—you might want to say conveniently, but I didn't mean to do it conveniently—as to who to square the blame with.

The blame for that lies solely with me as the ranking minority member. I did request that the chairman hold off EPA. That might be because I haven't been here long enough to understand how important it was to have them here first. I wouldn't want the record to now show that the chairman suggested they come first and I convinced him not to.

That was my mistake, and I am frustrated by that mistake, and I apologize to my subcommittee members because I am sure they are sharing that same frustration.

I will not make that mistake again.

Mr. WALGREN. Let the record show that I am not the chairman.

Thank you very much, gentlemen.

[Whereupon, at 4:40 p.m., the subcommittee recessed, to reconvene ... the call of the Chair.]

# FISCAL YEARS 1983 AND 1984 ENVIRONMENTAL PROTECTION AGENCY RESEARCH AND DEVELOPMENT AUTHORIZATION

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TUESDAY, MARCH 2, 1982

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURE RESEARCH AND ENVIRONMENT,
*Washington, D.C.*

The subcommittee met, pursuant to notice, at 2:10 p.m., in room 2325, Rayburn House Office Building, Hon. James H. Scheuer (chairman of the subcommittee) presiding.

Present: Representatives Scheuer, Carney, Schneider, and Sensenbrenner.

Mr. SCHEUER. Good afternoon. The Subcommittee on Natural Resources, Agriculture Research and Environment will come to order.

Today we will continue our consideration of the fiscal year 1983 budget request for research and development in the Environmental Protection Agency.

This particular hearing will focus on three important issues that will have a profound impact on the direction of EPA's research program.

The first deals with energy activities and environmental research which flows from the direction of a national priority for decreasing our dependence on Persian Gulf oil; our massive thrust for substitutes for oil: geothermal, biomass, wind, solar, tidal wave, and the rest, as well as our thrust toward synthetic fuels and our thrust toward coal conversion into oil.

The EPA proposes sharply to reduce EPA's energy research program and in view of this concensus we have achieved, that we must reduce our dependency on Persian Gulf oil. I must confess in advance of the hearing that I have grave doubts as to the wisdom of a dramatic reduction in energy research and development on the part of EPA.

The second element that we will be discussing is research in support of standard setting. We are concerned about health research, not only in EPA but in other agencies too, and how they can be directed and brought together to produce more meaningful health based environmental regulations.

We want to make sure that what we legislate and the standards that we set are based on thoughtful, cost-effective appraisals of costs and benefits. We cannot make those appraisals, we cannot fine-tune our thinking on standard-setting unless we have signifi-

cantly more data than we have now. To our minds, the move toward massive reduction in research and development budgets is very destructive of the standard-setting process.

Third, and finally, we will examine the development of pollution control technologies and the proper role of Government in producing new breakthroughs in pollution control.

The EPA, likewise, proposes here a substantial reduction in control technology development. They allege that industry should assume a greater portion for this burden. An obvious question is: Does industry have the incentive to invest more capital in pollution control? These are very serious and important questions.

I am very happy that we have a very distinguished group of witnesses to advise us today, and I thank all of them for the fine contribution that I know they will make. We have read their fine testimony.

Before we begin the hearing, I would like to yield to the distinguished ranking minority member of our subcommittee, Congressman Bill Carney of New York, for any opening statement he wishes to make.

Mr. CARNEY. Thank you, Mr. Chairman. The subcommittee meets again to discuss the fiscal year 1983 budget request for research and development at the Environmental Protection Agency.

The EPA proposal focuses on the Agency's highest priority research areas. They intend to concentrate on the statutory mandates, reduce backlogs, implement the original intent of Congress by delegating to the States wherever possible, and improve and enhance the science behind their programs.

The Agency has emphasized three themes:

No. 1, benefit and risk assessment in support of EPA's regulatory decisions and impact analysis activities;

No. 2, scientific support and technology transfer activities to help develop and install cost-effective pollution control technologies; and, finally,

No. 3, improved scientific quality through peer review, quality assurance guidelines, and specially designed information systems.

The total research and development obligations to meet this program are $230 million, down $87 million from the $317 million of 1982.

Decreases within the Agency have occured in the air, water quality, drinking water, toxic substances, and energy medias. Within these media, health effects research, environmental engineering and technology, and environmental processes and effects have experienced the largest cuts.

The Agency, however, has indicated that media cuts are in response to completion of several research efforts as well as to efficiencies in scheduling research and reductions in areas that were not cost-effective.

The Agency will have the opportunity to address the details of this budget in the near future before this subcommittee.

Given the facts of the budget, the necessity to cut back on Federal spending, and the Agency's commitment to protect human health and the environment, the question many have asked is: Can the Agency guarantee that the necessary thorough research, long-

term planning, and expertise will be in place to continue development of regulations and guidelines?

Today, we have five distinguished and qualified witnesses to present their enlightening views of the Agency's proposal, particularly the health research, control technology and energy programs.

I welcome them here today, Mr. Chairman, and I look forward to their contributions to this subcommittee. Thank you very much, Mr. Chairman, for the opportunity to make my opening remarks.

Mr. SCHEUER. Mrs. Schneider.

Mrs. SCHNEIDER. I have no opening remarks.

Mr. SCHEUER. Then we will go forward with the first witness, Dr. Donald Kash, from the University of Oklahoma. Dr. Kash, your testimony will be printed in its entirety in the record so, perhaps, you might wish to summarize your testimony—hit the high spots—in 7 or 8 minutes, and then I am sure we will have some questions for you.

**STATEMENT OF DR. DONALD KASH, GEORGE LYNN CROSS RESEARCH PROFESSOR OF POLITICAL SCIENCE, UNIVERSITY OF OKLAHOMA**

Dr. KASH. Thank you, Mr. Chairman. I am pleased to have the opportunity to testify on the proposed 1983 EPA budget. My testimony parallels your comments in introducing this particular hearing.

This budget represents a fundamental change in the Nation's approach to environmental management. It says that the Nation can do with substantially reduced scientific/technical information in the environmental area.

Mr. Chairman, the United States is a country which has relied more on scientific and technical information in its policymaking than is true in most other countries. The Congress has consistently preferred to approach policy from a pragmatic point of view. Congress has preferred to pass legislation and implement programs which have been pragmatically based; based on scientific/technical information. That is what the Congress has done generally with environmental legislation.

The environmental legislation that was passed during the last decade, for the most part, recognized that there was either a growing, or a potential, danger to the environment and human health in a whole variety of industrial activities. The clear mandate of that environmental legislation was that the EPA and other regulatory agencies set standards for pollution, or emissions and effluents, which protected the environment and human health to the extent possible, and specified that those standards should be scientifically based. Where that was not possible, the general approach has been to use the best available control technology. Presumably underpinning that approach is the notion that if you do not know what is safe, a prudent course of action is to pollute as little as possible. Both of those seem to me to be reasonably pragmatic and intelligent approaches to this particular area.

Insofar as environmental policy is concerned, there are three possible explanations for this budget.

The first is that there is no longer any significant need or public support for environmental protection. The second is that we know as much as we need to know to do the job. The third is that somebody else will do it if the Federal Government does not do it.

I think that none of those three positions will hold up. I have not come across anyone who believes that there has been significant change in public attitudes with regard to the environment. I know of no one who argues that we have adequate information about the environment, and I find it extremely difficult to believe that either the States or the industry will have the necessary incentive, and in terms of many of the States, the necessary resources to carry out this research.

It is my view that in a situation such as we face, where we have a number of areas of very real concern with regard to pollutants, and we do not have complete understanding, the only wise course of action is to continue a research and development program which moves us in the direction of incrementally better understanding.

I think it is the intent of the Congress that regulations should be modified as we learn more. The objective underpinning the support for research and development has been that over time we can evolve more cost-effective and more sensible regulations.

I know that there is a great deal of disenchantment with regulations in all areas of our society. I hope that we do not overreact. If we do, it seems to me that we are going to find ourselves in a position in the future where environmental events which become crises, at least in the media, will trigger demands on the Congress to act. Although I understand, Mr. Chairman, that Congress never acts in an uninformed fashion, nonetheless, it is possible that it might act in a less-informed fashion than it would if we had better understanding.

I conclude my comments by saying that, with regard to the energy area, I really have to extend the comments beyond, the perimeters of this particular hearing.

It seems to me that it is not prudent policy for the U.S. Government to back away from an approach to energy which provides incentives to the development of options to oil and gas. The energy crisis was triggered in the first instance by shortages of liquid fuels. I know of no one who expects that we are going to discover, domestically, sufficient liquid fuels to make up for the difference between domestic production and domestic demand.

It is not at all difficult to construct a scenario which sees the world economy turned around, go from negative to positive, and, therefore, the demand for liquids increase with that turn around and an unsettling event in one or two of the supplier nations, we will find ourselves back in a situation something similar to what we experienced initially in 1973.

It would seem to me that a prudent society would like to have some options out there. The most credible option at the present time, is synfuels from oil, shale, and coal. I am not at all sure that we ought to pursue synfuels on a full-scale basis, but I am convinced that wise policy would have us test a number of commercial-scale synfuel operations. I also think, that since one of the major constraints against those tests has been expressions of environmental concern, we should understand as much as we can about the re-

siduals from those processes and learn how to manage them as well as we can.

I write at the end of my testimony that if I were czar, this is not the kind of budget I would put forward. I thank you, Mr. Chairman. I will be happy to answer any questions.

[The prepared statement of Dr. Kash follows:]

TESTIMONY FOR
THE HOUSE SUBCOMMITTEE ON
NATURAL RESOURCES, AGRICULTURAL RESEARCH, AND ENVIRONMENT
by

Don E. Kash
George Lynn Cross Research Professor
of Political Science
University of Oklahoma

Mr. Chairman:
Members of the Subcommittee: I'm pleased to have this opportunity to testify on the proposed 1983 research and development (R&D) budget of the Environmental Protection Agency. My comments today focus on the public policy implications of the budget.

The proposed budget represents a cut of roughly 35% between 1981 and 1983. The cut in the energy R&D portion of the budget is in the range of 65%. If one factors out the portion of the energy budget specifically devoted to acid rain research, energy R&D is cut by roughly 75%. This budget, then, represents a fundamental change in the nation's approach of public policy to environmental protection. Clearly, the question before the Congress is whether this change in policy is wise or unwise.

In simple terms, this budget says that the nation can do with substantially reduced scientific/technical information in the environmental area.

Before I comment specifically on the proposed reductions in environmental-related research and development, I'd like to make a general comment about the role of scientific/technical information in American policy making. Policy making in this country, more than in any other country I know of, relies heavily on scientific/technical information. Any review of public policy in the United States impresses one with its pragmatism. The Congress has consistently preferred approaches to policy that work to those that are ideologically consistent and clean. It is this rejection of ideology and the preference for pragmatism that explains the Congress's consistent support of research and development.

In no area is this predisposition towards scientifically based, pragmatic policy clearer than in the area of environmental protection. When the environment became a major public policy issue, the Congress immediately sought to formulate legislation and establish regulatory programs which were scientifically based. Most of the major pieces of environmental legislation passed over the last decade have mandated one or both of two approaches to environmental protection. The first approach involved establishing emission or effluent standards for waste products. The environmental legislation has sought to insure that waste products not endanger either the public health or the environment. The clear mandate of environmental legislation is that standards be scientifically based.

The second approach to environmental protection has involved establishing standards for the best available control technology. The objective of this second approach has been to reduce the quantity of pollutants to the extent economically feasible, in those circumstances where there was not adequate science to determine with confidence what acceptable pollutant levels should be.

The use of this combination of emission or effluent standards and best available control technology resulted from a recognition on the part of both the scientific community and the Congress that our understanding of the impacts of pollutants on the environment was limited. The rationale underpinning the support of environmentally-oriented research and development has been, that as our scientific understanding improves the quality of our environmental regulations will improve.

So far as environmental policy is concerned, there ae three possible explanations for a budget of the kind proposed here. The first is that there is no longer any significant public support for environmental protection. If we are not going to regulate the environment, then we don't need improved scientific/technical information about the environment. The second explanation is that we have acquired adequate scientific understanding and no more work is needed. The third explanation is that either the states or industry should or will do the necessary research to provide for environmental protection.

With regard to the first point, I see no significant evidence of a public disillusionment with environmental protection. What I see is a good deal of disenchantment with cumbersome, bureaucratic regulatory modes that have grown up over the last decade. In no small part, the cumbersomeness of environmental regulations are tied to the tendency of regulatory agencies to substitute legal procedures in the absence of credible, scientific information. Procedural regulations are a means agencies use to evolve compromises, with regard to environmental standards. Unfortunately, they frequently result in both unsatisfactory and unstable regulation. My perception is that a good deal of the unhappiness with environmental regulation is the result of the inadequacy of regulatory procedures. We should not make the mistake of perceiving unhappiness with environmental procedures and regulation as a rejection of the commitment to environmental quality.

I've not come across anyone who believes that we have adequate scientific understanding of the environment and the impact of pollutants on it. The clear consensus is that our understanding of environmental science is limited and incomplete. If understanding is important to good public policy, then we have very compelling reasons for proceeding on with the search for that understanding.

Finally, I've found little convincing evidence that either the states or the industry have the incentive or, in many cases, the resources to pursue environmental science and technology with much vigor. In a time of fiscal stringency, it is extremely difficult to believe that the

states will devote substantial additional resources to environmental research and development. If one believes, as I do, that it is the responsibility of the business community to pursue profit, then with rare exceptions, it's hard to see how significant expenditures on environmental research and development will contribute to additional profits. In the absence of fundamental changes in public attitudes toward the environment, a significant change in our scientific understanding of the environment, or alternative sources of funding for environmental research, I must conclude that this budget is unwise public policy. I'm convinced that, only with a steadily improving scientific base will we have the development of more efficient and effective environmental regulation.

Only continuing, consistent support for research and development will build the base of scientific understanding which is necessary to the development of efficient, cost-effective environmental regulation. Further, it should be noted that we are dealing with a dynamic situation. As we proceed into the future, we as a nation are going to discover dangerous, new pollutants. We live in a complex, technological society. This society is continuously in the process of producing synthetic products. Synthetic products are products made by man and, in many instances, they are also products which can only be disposed of by conscious actions by man. There is growing evidence that synthetic products are the source of many health and environmental problems. I assume that we as a society do not wish to give up the advantages of these new synthetic products. In a context where most Americans are concerned with the quality of their environment and desirous of enjoying the benefits of new synthetic products, I can only conclude that we must work hard to understand and manage these synthetic products such that their health and environmental damages will be minimized. This can only be done with continuing research and development.

Environmental research, then, is a long-term, continuous need. We have, over the last decade, built up a research community in the United States which is making incremental improvement in our understanding of the environment. To see that research community dismantled or its efforts significantly reduced is not in the nation's interest. Mr. Chairman, the EPA R&D budget reflects only one component of a broad range of changes that are occuring with regard to the nation's handling of public policy. We as a nation clearly are in a phase where nearly everyone feels that detailed government regulation got out of hand. There is no one in this room who cannot identify regulations which have had little value while generating substantial cost. This budget seems to suggest, however, that the way to attack the evils associated with regulation is to attack the research which underpins it. My view is that there are powerful advantages to the public policy process in keeping the pendulum of environmental regulation from swinging too far in the direction of non-regulation. I cannot, for example, believe that there are not lurking down the road a number of graphic, environmental events which will be labeled in the media as catastrophies or crises. When the political climate changes and those environmental events occur, there are going to be tremendous pressures for immediate response by the government. Without a scientific

base, there will be strong pressures to react in an uninformed fashion. Those interests in society that are particularly sensitive to environmental protection will almost certainly take the posture that in a condition of ignorance we must simply stop the activity that has created the environmental event. One of the potential threats of inadequate understanding in the future will be to exacerbate and polarize the debate over environmental policy. My view is that this budget represents an example of overkill.

The portion of EPA's budget devoted to energy illustrates this. The budget appears to say that the Energy Crisis is over. In particular, there is no longer any major need for focusing on environmental research associated with such activities as synthetic fuel projects. We all know that the world now has a surplus of oil and that the price of oil is dropping. There is very encouraging evidence that substantial, new quantities of natural gas are being discovered in the United States. The short-term evidence is that we may be better off in terms of energy than any of us would have thought possible two or three years ago. My view is, however, that we should approach this short-term situation with a substantial amount of caution. A prudent society is one which keeps its options open. The major energy issue for the nation from 1973 on has been the lack of domestically produced liquid fuel. My own belief is that we should proceed with efforts to encourage the development of commercial-scale, liquid synfuels facilities. Only when we've had experience with commercial-scale facilities will we know whether liquid synfuels are a viable option in case of another emergency or in the long run.

My own judgments are that the impacts of large-scale synthetic fuel plants are quite manageable from an environmental point of view. They are, however, only manageable if we understand the residuals that come from those plants and do the work necessary to manage those residuals. I note in looking at the budget proposed here that monitoring of energy facilities is completely zeroed out. Health effects and ecological research remain as only a token set of activities, and work on control technologies is only a faint glimmer of what it was in 1981.

Cuts of this order make intelligent management of energy facilities in the future much less likely. I cannot consider cuts of this order to be in the national interest, whether from an environmental, economic, or energy point of view. A reliable, well-developed scientific basis for environmental management would be an important asset to American business. It has been, and continues to be, my impression that responsible business leaders in the United States are every bit as committed to environmental protection as any other set of interests. What the industry objects to is ill-informed regulations which change continuously. Unless one is prepared to believe that we are going to eliminate environmental regulations, and I've already indicated I do not share thlat view, then what we need are sensible, stable standards which provide a basis for planning and long-term development. I must conclude by saying that if I were Czar this is not the kind of budget I would present.

Thank you, Mr. Chairman, and I'd be happy to respond to any questions you or the Subcommittee might have.

Mr. SCHEUER. I thank you very much for your fine testimony: I read it with great interest. It was very cogently put. I agree with everything you said. It was very well done. Thank you very much. Congressman Carney?

Mr. CARNEY. Thank you very much. I, too, thank you, Dr. Kash, for your testimony.

In that testimony you cited three possible reasons for large cuts in the EPA research but you discount the validity of those cuts. What then do you believe is the reason for those large cuts.

Dr. KASH. I once heard a wise Member of this Congress say that there are two conditions in Washington; one in which policy makes budget, and one in which budget makes policy. I would suspect that the primary drive behind this is a need to cut the budget. That budget cutting is going on across the spectrum in all except a couple of areas. Reinforcing that, is, an attitude toward regulation, which suggests that you have too much of it.

I think it is pretty difficult to argue with that general notion. What seems to me to be happening here, however, is that there is a general notion that as we carry out research and we identify problem-pollutants, that then leads to regulations. We put regulations in place sometimes when we do not understand as much as we should. One explanation for this may be that if we do not understand the problem then we do not need to write any regulations and in a nonregulatory environment this is the approach. I do not find it to be very pallatable. I would prefer to see a situation in which we identified dangerous pollutants, acceptable levels, and had sensible regulations.

Where we have been in the past, it seems to me, is driven by a tendency to substitute procedures, and frequently judicial decisions, for what would be much more well done with an informed scientific base. Regulatory agencies all too frequently find themselves in a position of dealing with inadequate information by procedures.

Mr. CARNEY. I know you did not attribute it to yourself, but with that answer and with part of your statement that it is felt that there is a disenchantment with what you say, cumbersomeness of environmental regulation. Do you personally feel that to be the case?

Dr. KASH. Sure I do. The truth of the matter is that I really do not know of anyone who does not feel that in the last decade or so we have pushed regulations too far. I always choose my example from the small town I grew up in where there is a John Deere implement dealer. One of the Federal agencies ordered him to put in a ladies restroom. There was one right in the next building and since this was a one-block street and a very small town, his women employees had been using it for years. Now, I do not think that kind of regulation is necessary. I think there are some regulations in the environmental area which are unnecessary.

I do not think the way to deal with that problem, however, is a kind of a mass attack on the whole system.

Mr. CARNEY. Let me ask you this: There appears to be a mass attack in the energy area. Now, I am not speaking about the environmental aspect of the energy area; I am talking about how are we going to go about approaching our energy independence? We are out there—and you suggest that we get into these large-scale

types of operations that would give us an opportunity to see firsthand how, for instance, a shale plant would operate, what the effects of it would be, what the economies of it would be, and that type of thing. That creates a very difficult problem insofar as we are probably going to invest billions in these areas and perhaps we have 15 or 20 different types of techniques and we have to boil them down to using one. Along with that, you are going to be doing all the environmental research into how to apply types of mechanical devices to prevent the degradation of the environment on, let us say, 13 applications that we are never going to use. Would it not be better if we simply established the parameters of safety in regard to all types of pollutants and allowed industry or Government—on the other side of the equation, the side where they are going to build these processing plants and that type of thing—to meet—require, not allow—the standards, and EPA not design the mechanical methods to meet the standards? Would that be a little more efficient, less cumbersome? Certainly cheaper?

Dr. KASH. I am not sure that I agree with the conclusions you have come to. I would start by saying that we have no basis for establishing a set of standards in the first instance. The variety of expected residuals from those plants, for which we do not have standards is large. It has generally been our experience that large plants turn out pollutants that we do not expect; they turn them out in concentrations that we do not expect. In general, I do not think we have the basis for setting those standards at the present time. That is one reason why I think we need to test the plants.

It has been my observation——

Mr. CARNEY. Excuse me. I am confused. Why do you test the plants to get the standard?

Dr. KASH. One of the things you need to do with regard to environmental regulation is identify those residuals which you want to regulate. We have a limited number of residuals that are regulated at the present time. We really need to identify the range of pollutants and their impact on the environment. I know that one of the regular objections, particularly from industry people, has been the application of standards which are not sensitive to the environments they are operating in. These plants may range from North Dakota to western Colorado; the environments are quite different.

The truth of the matter is that at the present time I do not think we have any clear picture of what kinds of residuals those plants are going to put out.

Mr. SCHEUER. Will the witness yield?

Dr. KASH. Sure.

Mr. SCHEUER. This is the nub of our problem. I know that it has bothered all of us. Take the question of acid rain that we are all interested in, it is of particular interest to New Yorkers and also I might say Mrs. Schneider up in New England. We know that there are a lot of polluting, stationary plants in the Ohio River Valley. We also know as a somewhat-connected, but not an entirely-connected fact that we are getting a lot of fallout in the form of acid rain all along our east coast, all the way from Washington to New York, Rhode Island, Massachusetts, Vermont, and right up into Canada. It has had a devastating effect upon Canada's forest products industry which amounts to 17 or 18 percent of their GNP. It

has had a devastating effect upon the whole economy, and the sociology of the Adirondacks area. We know that there is some kind of casual relationship but it is a terribly complicated problem and we have had all-day sessions with scientific panels here who tell us that there is a cause and effect relationship but they cannot really nail it down; there is certainly not a linear relationship. There is no way by which they can tell us that if we have a reduction of X percent in pollutants in the Ohio River Valley in the production of those pollutants through those stationary plants that we will have a reduction of Y percent in the polluting effect it has 1,000 or 1,500 miles away. It seems logical to me that if we had a substantial reduction of polluting in the Ohio River Valley—if we could install scrubbers throughout—there would be a significant reduction in pollution; it is very hard to prove it empirically.

What do we do in a case like that? Our knowledge basis is really not sufficient for us to say that if we demand that industry undergo $10 billion of investment in the Ohio River Valley area that there will be a commensurate benefit worth $50 billion in the east coast of the United States and Canada. We have not been able to get that linear relationship between required investments and benefits. We have an instinctive feeling that if we pollute a hell of a lot less, there will be less pollution, but we are having an awfully difficult time nailing it down. We are hearing, not only from industry, that we have not proved this linear effect, but we have heard it from very distinguished scientists, both in academia and scientists with NOAA and EPA, who say that as a matter of logic you can expect a reduction, but how and in what relationship they do not know.

Strange interrelationships take place and strange phenomenon take place as these polluting matters flow through 1,000 or 1,500 miles of air. What should be our general approach? I am going to yield back the time after this question, but it really followed on logically from your question.

What should be our approach? Should we say that we have enough information about the harmful pollution effects of these stationary polluters to feel that at least a minimum level of control technology is appropriate? Then, do we have this multidisciplinary, cross-agency, 3-to-5 year research program that might justify a further incremental level of controls? We are really terribly puzzled. We want to do the right thing but we do not want to engage in some of the regulatory silliness of the past. We are very frustrated in how we carry out our mandate to protect, and I feel that Bill Carney would agree that we have to protect our environment too. We do not want to see strip mining run rampant and have our hills and valleys and our beautiful national inheritance dessimated and degraded. We want to protect our environment and our health as we go forward with this massive energy push, but we know that we do not have the knowledge-base to do more than something. What is that something that we can afford now to do prudently, and how do we phase in further regulatory controls that will be matched by an increase in our knowledge-base?

Bill, do you want to perfect my question? It is all very fuzzy and confused. Do you want to try?

Mr. CARNEY. I think maybe we will give the doctor an opportunity to respond now. We are doing this with a little bit of looseness, which is good. We can get into a dialog back and forth as the chairman likes to do.

Dr. KASH. I have no answer to your question.

Mr. SCHEUER. We were hoping you would have a very simplistic, clear answer. [Laughter.]

Dr. KASH. I was tempted, but I sit here and watch you smoking that cigar and think to myself that this same argument about cause and effect is one I have heard for years from the tobacco industry: Presumably, all we have is a statistical relationship.

Let me make at least a couple of comments: I think that the body of understanding of the environment and of the various residuals on the environment is at a very nascent stage; we are a long, long way from getting any complete answers in that or many other areas.

There is, in fact, a cost-benefit judgment which has to be made on limited information. As best I can tell that is what we have you folks for. I mean, those are the tough calls that get dumped in your lap.

It would seem to me that one does a couple of things in this process. The first is that you have a sustained effort to try and increase the understanding. The reason for that, presumably, is not because of any addiction to understanding, but because you hope that you can manage it in a more cost-effective fashion. I just want to pick up on that and say that I do not like to see these bumps in research and development budgets because I think that is disruptive to that process.

The second thing, I guess, I would say in this process is that if I were to ask my father, who never claimed to have any understanding of science or this process, he would, nonetheless, say that anything you could do within reasonable cost to reduce the quantity of pollutants, you ought to do.

Mr. SCHEUER. Is that about the best we can say now, and maybe it is?

Dr. KASH. I, at least, try to follow this as a nonexpert and I do not know what else we can do. Again, that I would love to have an option to what EPA has done, at least conceptually; which is, where possible to try to set standards, and where that is not possible then to say, "Well, if I do not know, I would rather not have the junk."

Mr. SCHEUER. If I do not know, I would rather not have the——

Dr. KASH. I would rather have the minimum amount of pollutants dumped out. There is a real need, I think—to simply push in the direction of trying to find efficient, low-cost ways of cleaning up pollutants.

I notice that one of the other people who is giving testimony here today focuses on some of the clean-up technology for coal. I just continue to come down to the conclusion that we are going to end up relying on a lot more coal in this country. I also am prepared to believe that coal is a real problem unless we learn how to manage it. I think we must learn how to manage things in these complex areas—and in response to your earlier question, Mr. Carney—by proceeding on with a kind of regularized program. I am not sure

that we need 12 or 13 plants, but some smaller number, testing different processes, yes.

If you use one kind of process versus another, you get very different residuals out of those processes. I would like to see the tests done, both in terms of just the economics of producing a fuel and in terms of the economics of managing residuals. I think we are going to have to manage.

Mr. SCHEUER. Let me yield back to you for one more question and then we will go on to Mrs. Schneider.

Mr. CARNEY. The point I am trying to pursue here is that we are trying to define the role of the EPA in its research and development program: that is the responsibility of this Committee. I am not so sure that EPA's role is one that would require them to design, say stack scrubs, so that a plant that was running coal would discharge a quality—the quality of its discharge would be such that it would meet standards. I think our responsibility is to understand the standards, understand the health effects of the pollutants that are discharged, and set those standards. Then, industry or Government, but not EPA's research and development programs, should be required to meet them.

Dr. KASH. That is an approach. It is an approach that many people take: What do you do when you do not know what the standards should be? How do you set them?

Mr. CARNEY. That is what we have to concentrate on. We have to find standards but we do not have to find the ways to insure that someone who is manufacturing pipes for fences down the street, and who is coating them with zinc or something like that, have to find a way for him to do that manufacturing process to meet our standards, that is his responsibility. It is our responsibility to set the health standards.

Dr. KASH. If we set standards for pollutants that we do not understand, and we do not understand what their impacts are, we really are in a process of never-never land and we are a long way from being able to do that across-the-board.

Mr. CARNEY. I cannot agree with you more. That is why I am trying to highlight what I am saying: We should concentrate our effort in understanding the standards and not concentrate our effort in trying to find 15 different solutions to 15 different techniques because (1) industry is going to take the most cost-effective technique and you realize that and (2) our Government has just gone out and found 18 or 14 different ways of doing the process, 80 percent of which will never be used. What we have done is taken a resource away, meaning, money and time and people, from studying, what I think is EPA's responsibility in research and development: Which should be understanding standards that have to be met and understanding the effects of a particular process.

Dr. KASH. Once again, one needs to start by trying to understand what a pollutant in any given environment will do.

Mr. CARNEY. Agreed.

Dr. KASH. The starting point, unless you are going to go across-the-board and establish a standard for every synthetic material that might conceivably be produced, is to try and identify what those pollutants will be and how they will react in a given environment.

Mr. CARNEY. I have no problem with that.

Dr. KASH. I do not really know how you would do that with synthetic fuel plants. My engineering colleagues tell me that as you scale up these plants, you tend to get different outputs that we do not understand much about.

But, my original comments, as I said, went beyond EPA. This committee has a role that goes fairly broadly. I do not really care how it is done, but I would like to see incentives built into the system for the test of synfuels plants. It would be great, from my point of view, if the industry did this. Whether they are more or less efficient, I would just like to see someone do it. But, we are in a posture at the present time where the incentives for doing that are simply being withdrawn.

I am in the midst of writing a book which is an effort to look at energy policies since 1973. In the process of doing that I went back and looked at the history of oil, gas, nuclear energy, the electric power industry, and coal. There is nothing new about the Federal Government providing incentives; that has been going on in all of those areas for a very long time. If the route to take is to put it in the private sector ballpark, then hurrah. I would like to see it done. What disturbs me is that I think we are backing off across-the-board.

Do you have a rollcall?

Mr. CARNEY. We do. I will yield to my colleague from Rhode Island and I appreciate her patience and kindness.

Mr. SCHEUER. Let me say that this chairman considers himself very fortunate to have the very hard-working and dilligent and thoughtful members of the minority that he does. Most of the time, it is these three members who are here. We have less contributing members on the Democratic side, I am embarrassed to say, than on the Republican side. These two members are exceptionally contributing and productive, so I am happy to yield to Claudine Schneider of Rhode Island.

Mrs. SCHNEIDER. As we told you, Mr. Chairman, flattery will get you everywhere.

Dr. Kash, are you familiar with EPA's budget and the details of it?

Dr. KASH. I have the materials that were provided to me by this subcommittee.

Mrs. SCHNEIDER. Might I ask you—and you are familiar with it? You have read through the materials that our subcommittee has provided you with?

Dr. KASH. Yes.

Mrs. SCHNEIDER. Have you noted of late in the media some of the changes that are taking place in addition to the details that you read that we sent to you insofar as EPA's budget is concerned? In other words, are you pretty much on top of that situation?

Dr. KASH. Well, I do not know that I am on top of it. I am aware of some of it.

Mrs. SCHNEIDER. I wonder if you could give me your own personal analysis of what you believe the long-term impact will be if the kinds of reductions in EPA research do take place?

Dr. KASH. Congresswoman, my belief is that, with regard to research, there is a process of building up a research-base capability and the need is to sustain that on a fairly steady basis.

Now, there are a couple of things that are happening in this process. One is a pretty rapid reduction in funding and another is a kind of message to researchers to get the hell out of this business. I think we will probably pay a cost for that.

Mrs. SCHNEIDER. You have not quite clarified how detrimental that will be and how long-term of an impact that might have?

Dr. KASH. I really do not know how to put numbers on it, but I think that before we get anything that we are going to get a kind of consensus on in this society with regard to environmental information, we are talking about decades.

Mrs. SCHNEIDER. Thank you, Mr. Chairman.

Mr. CARNEY. If I may, Mr. Chairman?

Mr. SCHEUER. Go ahead.

Mr. CARNEY. I would like to get back to that other aspect I was talking about and that is our problem here, as a Committee, with certain responsibilities, with a certain segment of the budget. We are dealing with limited finances and we have to utilize those finances the best way we can. I see as an answer—and maybe not the best answer—but I see as an avenue that we could pursue a method by which we could more clearly delineate the responsibilities of EPA and their research and development budget.

I still cannot justify the necessity for EPA to design a manufacturing process or an energy producing process, a method for that process to meet standards, because it takes an enormous amount of commitment: money, man-hours, man-years, to do precisely that. When we do that we have not made the commitment to understanding the standards or the causes and effects of the pollutants that are the byproducts of certain processes. I would think that this is something that we have to do. We have to say that we cannot be in that business, at least not the research and development part of the EPA. Maybe a grants program can. We are in the business of helping local communities through Public Law 92-500 with sewers and that type of thing. Maybe you can set that up and fund it separately. But to take this needed money out of research and development to find ways to allow a manufacturing process or an energy-producing process to meet standards, which I think you and I would agree on are not the best, might be a great mistake.

Dr. KASH. I remain of the opinion that EPA should add a minimum with regard to control technology. I have a program underway which tries to monitor and identify the performance of control technology. There are two kinds of standards, you know, one is talking about here: One is emission standards based on what the environment or human health concerns would specify; the other is standards for admission which are based upon the best available control technology. Now, if EPA does not have any work going on in that area, I find it a little difficult to understand how they are going to do this.

I headed part of the geological survey for 3 years which regulates energy and mineral development on Federal, Indian, and OCS lands. We had in place—EPA then took it over—some discharge standards. Now, those discharge standards were based upon what

was an economically viable cleanup system: they really allowed you to dump out a very small amount, and the cost was not very large as a matter of fact. Those minor discharges were sort of a nonissue; they were perfectly acceptable. One of the things that was needed, however, was enough work in that area so that you knew what you could viably do in terms of the cost to an industry. What I see going on with regard to this program and, I guess the EPA standard setters could read the advertisement of the equipment salesman, I do not think that is good enough.

I am not really trying to suggest that EPA ought to get back into the business of developing flu glass desulfurization facilities which cost very large amounts of money, but I do not know how you can approach the program pragmatically by wiping any of this out: we are operating in a condition of kind of incremental ignorance.

Mr. CARNEY. Mr. Chairman, I think we have about 7 minutes remaining. I would respectfully request that I leave to vote.

Mr. SCHEUER. One problem is that in the depressed state of the economy today when we seem unable to compete abroad; when car sales are at an all-time low for the last two decades with the Japanese, West Germans, and Swedes being able to deliver steel f.o.b. Pittsburgh in this country cheaper than we can produce it and put it on a freight car in Pittsburgh; any incremental addition to the cost of manufacture of cars, or steel, or electric, or energy supplies, to a lot of politicians and a lot of people is unacceptable, and, therein lies the nub of our problem.

Dr. KASH. I would certainly agree with that but I have got to be a little uneasy about examples of that kind. One would have to go a long way to convince me that the steel industry in the United States, would be competitive if they did not have to clean anything up.

Mr. SCHEUER. If they did not have to clean anything up?

Dr. KASH. Yes.

Mr. SCHEUER. Well, they are not competitive now and they are not cleaning anything up.

Dr. KASH. I am just suggesting to you that my reading of the steel industry is that to hang its problems around the neck of environmental regulation is a convenient excuse for a lot of bad choices in other areas.

Mr. SCHEUER. I quite agree with you. They have been disinvesting in steel over the last three or four decades; they have underinvested in research and development and in new plant equipment so that their plants are very nonproductive and very expensive. They produce a high-quality product but simply cannot compete with local markets. They still say, nevertheless, that they are trying to survive and we are walloping with this and how can that happen? When you have 3,000 unemployed in the auto industry, it is just very hard to clobber them again as they go down for the third time.

We do have a rollcall vote that is just finishing and we then have two more rollcall votes right after this so we will recess for about 15 minutes and then we will take up the two remaining panels.

Thank you very, very much, Dr. Kash, for your testimony. We will recess for 15 minutes.

[Whereupon a recess was taken at 3 p.m.]

Mr. SCHEUER. The subcommittee will resume.

We will now hear from the Panel No. 1, Dr. Roger McClellan, director of the Lovelace Inhalation Toxicology Research Institute, and Dr. Morton Corn from Johns Hopkins University.

Gentlemen, we are very pleased you are here and we look forward to your testimony. Your prepared testimonies will be reprinted in full in the record. We suggest that you each take about 5 minutes to hit the highlights of your testimony, perhaps respond to anything you have heard this afternoon, if you feel that is appropriate and then Congressman Sensenbrenner and I will have some questions for you.

Why do we not start out with you, Dr. McClellan?

## STATEMENT OF DR. ROGER O. McCLELLAN, DIRECTOR, LOVELACE INHALATION TOXICOLOGY RESEARCH INSTITUTE

Dr. MCCLELLAN. Thank you. Good afternoon, Mr. Chairman and committee members.

I am Roger McClellan. I am a toxicologist and research manager whose primary interests are in the conduct of research that will provide an improved basis for estimating the potential health impacts to man from environmental or occupational exposure to various pollutants. Currently, I serve as president and director of the Inhalation Toxicology Research Institute in Albuquerque, N. Mex.

During the past decade, I have served in an advisory capacity to the Environmental Protection Agency in several different areas. Obviously, I will draw upon some of that experience in terms of the testimony I present here today, however, what I present represents my own personal opinion.

I deviated from my original direction when I started to prepare the testimony. I originally prepared some remarks on research management within the EPA; those are attached as an appendix to my testimony. However, after studying the administration's budget submission in considerable detail, I decided to shift the focus of my comments and consider more broadly the future of environmental and occupational health research.

An appropriate starting point is contained within the President's budget message: "The goal was and remains the return of noninflationary and sustained prosperity. We seek a larger economic pie to provide all Americans with more jobs, more after-tax income and a better life." In considering that statement I have presumed that a better life included provision of environment at home, work, and/or at play that does not pose unreasonable risks to my health or that of my fellow man. Further, I assume that it provided, in addition to freedom from overt disease, a pleasant environment that I can enjoy.

As I reviewed the budget, what came through to me was concern not only for the fiscal year 1983, but the projections through 1987. In a sense, the reductions proposed for fiscal year 1983 are only the beginning and I am sure that has come through to you as you have reviewed a massive reduction in terms of the discretionary programs, including the programs of the EPA; a reduction of perhaps 50 percent from 1987 compared to 1981 as a portion of the Federal budget.

The budget document does state that advances in science and technology are important; unfortunately, there is no strength to that conviction in the budget document. I would view the budget document, overall, failing to recognize the role of research in the long-term development and maintenance of a strong economy. Strong support of military research and development is needed but is not sufficient by itself.

It appears that the cuts in the EPA budget are driven by the view stated in the President's budget document, "We are also moving to shackle the regulatory juggernaut that burdened production, consumed jobs and diminished productivity growth."

Thus, there are legitimate concerns for strengthening our economy and our defense, but ultimately, I think, we come to the point I have just given and arrive at the conclusion that the budget as regards science and the environment represents an inappropriate and short-sighted decision that will have long-term negative impacts; exactly the opposite of those that are desired.

It is my opinion that a dismantling of our national effort to understand the environmental and occupational factors that influence health will deprive us of knowledge and intellectual capital that will be sorely missed in 5 to 10 years.

A strong economy must be based on new technology and capital investment. If new technologies are to be used we must have the knowledge base to balance potential environmental and occupational health impacts against other costs and benefits.

Regulations, in my view, are inevitable. The development of such regulations requires both a knowledge base and an appropriate interpretation of the knowledge. The administration's budget proposal notes that "during the past year no significant new regulatory statutes were enacted and few major new regulations were imposed." I would like to take the positive and optimistic view that this course of action was possible because we had a base of knowledge that allowed these decisions to not regulate, to be made based on knowledge rather than on ignorance or a blind disregard of the facts. In fact, I know that several decisions to not regulate or to modify regulations were based on improved knowledge. That knowledge was gained from research we initiated 5 and 10 years ago. We need to keep that in mind as we look at the impacts of what we are doing today.

It is important to realize, in the same vein, the full impact of the research being done today or that will be left undone because of the budget that is proposed will not be evident for several years.

In short, it is clear to me that the sharp reductions in funding for environmental-related research are very shortsighted. The lack of knowledge is going to be substantial. In one area, the area of energy, the argument has been raised that we are going to be doing more with less by better coordinating the work of several agencies. This has a particularly hollow ring in the energy arena where both the EPA and the Department of Energy programs are being reduced by over 20 percent. It would appear that we are going to forgo the opportunity to develop the data base needed for regulatory decisions on energy in the next decade.

Others will respond that the private sector will take over and that the Federal Government should focus its efforts on long-term,

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high-risk research. I would submit that essentially all environmental research is, by its nature, long term and high risk. It does not yield, in most cases, return to the private entrepreneur that would justify his investment of capital to support that research.

Beyond that, most materials to which people are exposed do not originate from a single proprietary source, or even a single industry. The same material frequently gives rise to both workplace and environmental exposure. Once released, these materials do not respect property lines or governmental boundaries in their movement. Thus, I am strongly of the opinion that the Federal Government must play the central role in supporting environmental research.

I would like to digress for a moment and consider by analogy the extent to which good research is essential for sound regulations, or the lack of regulations, and the accompanying technological development. The analogy I would like to use is a car traveling on a highway. The conditions of the various sections of the road, i.e., curves or straight sections, determine the speed with which the car can move. In case A, a very conservative approach is taken to avoid the car going off the road on curves—the speed limit is set at 20 m.p.h. We obviously go down the road but the net outcome is not very good. In case C, a go-for-broke approach is taken and the speed limit is set at 60 m.p.h., perhaps out of ignorance or a disregard for potential hazards. Ultimately the car fails to negotiate a hairpin curve and the outcome is unfavorable. In case B, good research has provided knowledge of the road conditions. There are hairpin curves that must be driven at 20 m.p.h., but there are other sections that can be driven at 40, 60, 80 m.p.h. In fact, it is possible that the average speed may be over 60 m.p.h.

The point I am trying to make is that until you study the environmental or health impacts of a technology or a new product, you cannot even make the decision of whether to regulate or not regulate. If the decision is made to regulate, a base of knowledge is needed to establish realistic regulations. When you have an adequate case of information you can travel the road, or move the technology at the maximum rate and also avoid negative environmental impact. It is my personal opinion that the decision to not regulate may, in fact, require the largest amount of information.

The proposed budget is going to require drastic changes; there is no question about that. Unfortunately, it is likely to emphasize the short term at the expense of the long term, the use of the "sure cinch" approach at the expense of innovation. The investigation of the current problem, acid rain, is obviously a concern, but I hope it will not be our concern 10 years from now. We really need to be addressing our attention to other problems that we can look down the road and see. I think that the budget that is proposed will result in frequent changes of direction in attempts to respond to the crises of the moment; just exactly what we do not need.

I will enumerate a few of the changes, or issues that I think must be considered:

(1) Addressing the issue of funding and manpower for several EPA laboratories by considering whether they should "starve together" or should some be closed and some allowed to flourish. There simply is not room in the system to continue to cut away at

20 and 25 percent per year. Some of them will have to be closed, some of them probably should have been closed in the past because they simply do not have a critical mass.

(2) For those laboratories that are to remain, we must consider the needs of the Agency and delegate lead laboratory responsibilities.

(3) Carefully weigh the staffing requirements of each laboratory and staff them appropriately. I would suggest the need to lower the ratio of professional to support staff, maximizing the number of professional personnel; we are just not going to have the manpower there. We are going to have unemployed scientists or underemployed scientists and we are going to be retraining them in other areas; the field is going to be going through a drought.

(4) Inherent in this is a need to maximize the dollars actually expended on research and support of scientists. This has a corollary of reducing the reliance on "beltway bandit" think tanks and task order support service contractors.

(5) We are going to have to establish mechanisms to expand the extramural research program. The existing extramural research program is really just coming into its own, yet it is slated for substantial reductions this year, and essentially it is eliminated in 1983. It is critical to have a cadre of personnel outside of the Agency who are performing research in areas of interest to the EPA, and provide an unbiased and independent judgment of matters that are important to the Agency and are available for their use in advisory roles.

(6) It is important to develop mechanisms to provide budgetary authority that promotes stability in the research program, and to develop means of keeping an appropriate mix of personnel on the EPA staff; not just a mix of different kinds of people, but particularly critical in the face of decreasing staff levels, to find means to bring in young, new investigators, or else the field is going to die at an accelerated rate.

(7) There should be avenues sought to identify means for joint government-industry support while satisfying the vested interests of each of the several parties, and

(8) Finally, a need to strive to insulate science from the political winds that change rapidly in direction and intensity.

In summary, the decision to regulate or not regulate and the nature of the regulation can only be made when there is an adequate base of scientific knowledge. The failure to provide adequate support now for environmental and occupational health research will result in added costs later. These added costs may be in the form of retrofit control technology, unnecessarily restrictive regulations or ill health. I urge you to carefully consider the options and look beyond the 1983 budget. If the choice is to elect a short-term reduction in research funds, then the decision should be implemented with extreme care to minimize the long-term true costs.

I would be pleased to respond to any questions you may have.

[The prepared statement of Dr. McClellan follows:]

STATEMENT OF

DR. ROGER O. McCLELLAN

BEFORE THE

SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURAL RESEARCH AND ENVIRONMENT

COMMITTEE ON SCIENCE AND TECHNOLOGY

U. S. HOUSE OF REPRESENTATIVES

March 2, 1982

Good afternoon, Mr. Chairman and members of the subcommittee.

I am Roger O. McClellan. I am a toxicologist and research manager whose primary interests are in the conduct of research that will provide an improved basis for estimating the potential health impacts to man from environmental or occupational exposure to various pollutants. For over 20 years I have studied the effects of internally-deposited radionuclides. During the past 10 years, my interests have broadened to include concern for a wide range of materials released from different energy technologies. Currently, I serve as President and Director of the Inhalation Toxicology Research Institute in Albuquerque, New Mexico. By way of background, the Institute has a multidisciplinary staff of 75 professional and 150 supporting personnel and is operated by the Lovelace Biomedical and Environmental Research Institute, a non-profit corporation for the U. S. Department of Energy. An extensive research program focusing on the toxicity of airborne materials is conducted for the U. S. government in government-owned and equipped facilities. The program is a balance of basic and applied and short- and long-term research.

During the past decade, I have served in several advisory roles to the Environmental Protection Agency. I have served as a member of the Executive Committee of the Science Advisory Board (SAB) since its formation with the

exception of 1980-1981. I currently serve as Chairman of the Environmental Health Committee and as an ad hoc member of the Clean Air Scientific Advisory Committee for review of the criteria document on sulfur oxides and particulate matter. Other notable assignments have been as (a) co-chairman of the committee that reviewed, at the request of Congress, the Agency's health effects research program, (b) Chairman of a committee that reviewed the first criteria document on airborne lead, and (c) Member and Chairman of several committees that reviewed the Agency's annual 5-year plan for environmental research, development and demonstration. A personal resume is attached as Appendix A.

I am appearing today at your request to discuss the Agency's health research plan. The remarks I make reflect my own personal opinion and are based on:

1. My experience as a scientist and research manager;
2. my knowledge of the EPA gained through participation in the Science Advisory Board; and
3. a detailed review of the "Budget of the United States Government - Fiscal Year 1983" and supporting budget documents.

Prior to receiving the budgetary information, I had developed some general comments on management of research within EPA. Those comments are now included as Appendix B to this testimony.

However, after studying the Administration's budget submission, I decided to shift the focus of my comments and consider more broadly the future of environmental and occupational health research in the context of the budget submission. An appropriate starting point is provided by a quote from the President's budget message of February 8, 1982 — "Our goal was and remains economic recovery - the return of non-inflationary and sustained prosperity. We seek a larger economic pie to provide all Americans more jobs, more after-tax income, and a better life."

In considering this statement, I have presumed that a "better life" includes provision of an environment; at home, at work and at play that does not pose unreasonable risks to my health and that of my fellow man. Further, I assume that good health includes not only freedom from an excess of overt disease, but a pleasant environment that I enjoy seeing, smelling, tasting and touching.

A further review of the budget and especially of projections through 1987 indicates the extent to which the Administration is proposing a drastic re-ordering of federal expenditures. In a sense, the reductions proposed for FY-1983 are only the beginning. By 1987, it is projected that 37% of the budget outlays will be used for national defense, 33% for social insurance and 10% for interest, leaving only 20% for all other budget outlays. Environmental and occupational health-related research is included within these latter, so-called discretionary, outlays. As a fraction of the GNP, these are reduced by 40% from the 1963-1973 time period and over 50% from 1981.

The budget document does acknowledge the importance of science and technology with the statement "Advances in science and technology are essential to the security of our Nation, to the health, welfare and safety of our citizens, and to the long-term growth and vitality of our economy." Unfortunately, there is apparently no strength to this conviction as evidenced by the budget. Indeed, it would appear that the cuts in the EPA budget are driven by the view that "We are also moving to shackle the regulatory juggernaut that burdened production, consumed jobs and diminished productivity growth."

Thus, it is my opinion that legitimate concern for strengthening our economy and our defense, controlling government expenditures and achieving regulatory reform has triggered the decision to sharply curtail environmental and occupational health research. This is an inappropriate, short-sighted decision that will have long-term negative impacts exactly the opposite to those that are desired.

A dismantling of our national effort to understand the environmental and occupational factors that influence health will deprive us of knowledge and intellectual capital that will be sorely missed in 5 to 10 years.

A stronger economy must be based on new technology and capital investment. If new technologies are to be used we must have the knowledge base to balance potential environment and occupational health impacts against other costs and benefits. I use the word impacts advisedly to leave open the possibility of their either being negative (i.e., costs), benign or positive (i.e., benefits) relative to other uses of our national resources.

In some cases the weighing of relative costs and benefits will be guided by regulations. The development of such regulations requires both a knowledge base and an appropriate interpretation of the knowledge. The Administration's budget proposal notes that "during the past year no significant new regulatory statutes were enacted and few major new regulations were imposed." I would like to take the optimistic view that this course of action was possible because we had a base of knowledge that allowed these decisions to not regulate, to be made based on knowledge rather than on ignorance or a blind disregard of the facts. In fact, I know that several decisions to not regulate or to modify regulations were based on improved knowledge. The decision to not regulate hydrocarbons as a class and the move from a total suspended particulate (TSP) to a respirable size fraction standard for particulate matter are cases in point. In considering these, it is important to realize the research that allowed these decisions to be made was initiated years ago. In the same vein, the full impact of the research being done today will not be evident for several years.

In view of the foregoing, one must ask if the sharp reductions in funding for environmental-related research are not short-sighted. I believe they are.

The lack of knowledge a decade from now will deprive us of the opportunity to make wise decisions at that time. Some individuals may respond by indicating more will be done for less by better coordinating the work of several agencies. Although there is always room for improvement, I should emphasize that much has already been achieved by interagency cooperation (i.e., the Interagency Regulatory Liaison Group of the last administration and the Vice President's working group in this administration). The opportunity for further improvements in efficiency by interagency coordination is probably small. The argument for accomplishing more with less has an especially hollow ring in the energy arena where both EPA and the Department of Energy programs (slated for transfer to the Department of Commerce) are being reduced by over 20%. It would appear that we are foregoing the opportunity to develop the data base needed for regulatory decisions on energy that may well be needed in the next decade.

Some others will respond that the work will be done in the private sector, that the federal government should focus its efforts on long-term, high-risk research. This concept is easy to understand and interpret when one considers hardware oriented and other activities in which the technological developments from shorter-term research has high potential for economic return to those who support the research.

A number of factors combine to minimize the applicability of the "long-term, high-risk" definition to environmental research or if it is used to suggest that essentially all environmental research fits it. The basis for my opinion relates to the following considerations; (a) most materials to which people are exposed do not originate from a single proprietary source or even a single industry, (b) the same material frequently gives rise to both work place and environmental exposures, and (c) once released, emissions or effluents do not

respect property lines or governmental boundaries in their movement. Thus, I am strongly of the opinion that the federal government must play the central role in sponsoring environmental research.

I would like to digress for a moment and consider by analogy the extent to which good research is essential for sound regulations (or the lack of regulations) and technological development. The analogy I would like to use is a car (the technology) traveling on a highway. The condition of the various sections of the road, i.e., curves or straight sections, determine the speed with which the car or the technology can move. In case A, a very conservative approach is taken to avoid going off the road on the curves — the speed limit is set at 20 MPH. The car or technology obviously negotiates the road but the net outcome is poor because of the slow rate of speed. In Case C, a go-for-broke approach is taken and the speed limit is set at 60 MPH, perhaps out of ignorance or a disregard for the potential hazards. Ultimately the car or technology fails to negotiate a hairpin curve doing damage to the car (the technology) and to the environment. In Case B, good research has provided knowledge of the road conditions. There are hairpin curves that must be driven at 20 MPH, but there are other sections that can be driven at 40, 60 or 80 MPH. In fact, it is possible that the average speed may be over 60 MPH.

The point I am trying to make is that until you study the environmental or health impacts of a technology or a new product, you cannot even decide whether or not to regulate. And if the decision is made to regulate a base of knowledge is needed to establish realistic regulations. When you have an adequate base of information you can travel the road or move the technology at the maximum rate. It is my personal opinion that the decision to not regulate may, in fact, require the greatest amount of information.

The proposed budget is going to require drastic changes, some of which I would advocate even in the absence of curtailed budgets. In making these

changes, I urge that they be made only within the framework of a well-thought out long-range plan and that they be made decisively. This will minimize the waste and the negative impact on morale that has characterized the frequent start-stop, up-down and lateral changes of recent years in EPA generally and in ORD specifically. Let me emphasize that such changes are not new with this adm :tration, they seem to have been part of EPA almost from its beginning.

The proposed budget is going to require major changes in the Agency's research program. It will put a premium on efficiency and the establishment of priorities. Unfortunately, the budget is likely to emphasize (a) the short term at the expense of the long term, (b) the use of the "sure cinch" approach at the expense of innovation, (c) the investigation of the current problem, i.e.. acid rain, at the expense of concern for next decades problem, and (d) frequent changes in direction to attempt to respond to the crisis of the moment.

I will enumerate a few of the changes or issues that must be considered.

1. Address the issue of funding and manpower for the several EPA laboratories by considering whether they should "starve together" or should some be closed and some allowed to flourish. The resources requested ($ and man-power) in the administration's budget are unlikely to allow all of the existing EPA laboratories to continue. It must be recognized that for any laboratory a critical mass is necessary. To allow a laboratory to limp along understaffed or staffed with "tired, oldtimers" does not serve the public good.

2. For those laboratories that are to remain, carefully consider the total long-term needs of the Agency and the capabilities of the laboratories and delegate specific lead laboratory responsibilities to each laboratory. Within this approach try to cultivate "centers of excellence" that are oriented to performing research directed to the major statutes that the Agency must follow.

3. Carefully weigh the staffing requirements of each laboratory and then staff them adequately. In my view this means staffing it with either government

employees or contractor employees so they can function as an integrated team. In the face of stringent personnel ceiling, this might suggest the need to have some laboratories operated under long-term contracts by either universities or private industry.

4. Lower the ratio of professional to support staff, maximizing the number of professional personnel. I advocate this approach for two reasons. First, professionals have a broader range of skills that can be used to meet the needs of the Agency. Second, there will be an increasing number of professionals available for employment. If they are not employed, they will be unemployed, under-employed or being retrained. I presume that many of the support personnel can move to other fields.

5. Inherent in the above suggestion is a recommendation to maximize the dollars actually expended on research and support of scientists. This has a corollary of reduced reliance on "beltway bandit" think tank personnel or task order support service contractors. In short, either do the work with government employees or award a contract or grant to a university or private firm to carry out a program or a major element of it. A related need is to reduce the number of support (or non-research) positions within EPA to an absolute minimum. To the maximum extent, responsibility for planning and managing the research program should be delegated to the field laboratories.

6. Establish mechanisms to expand the extramural research program. This is critical to provide a cadre of professional personnel who are performing research in areas of interest to EPA and are available for use in advisory roles, such as the development and review of criteria documents. The peer-reviewed research program slated for sharp reductions and perhaps discontinuation in FY-1983 was a positive step toward improving the quality and extent of the extramural program.

7. Provide budgetary authority that promotes stability in the research program. This is critical both for in-house and extramural research. To assure long-term continuity for the extramural program, the Agency should be provided authority for funding grants or contracts for 3 years.

8. Develop means for keeping an appropriate mix of personnel on the EPA staff. This should include not only individuals from the various disciplines needed, but also a mix of individuals ranging from new graduates to seasoned researchers. It is particularly critical in the face of decreasing staff levels to have means by which young new investigators with contemporary training can be added. A system of special 2-3 year duration "Environmental Science" postdoctoral fellowships may be one vehicle worth exploring.

9. Avenues should be sought to identify means for joint government-industry support of research programs while satisfying the vested interests of the government, industry and the public.

10. Strive to insulate science from the political winds that change rapidly in direction and intensity.

In summary, the decision to regulate or not regulate and the nature of the regulation can only be made when there is an adequate base of scientific knowledge. The acquisition of such knowledge requires careful planning and diligent effort from dedicated teams of scientists. At our present state of development, the easy and the obvious questions have been answered. What remain are complex problems that will require years to solve. Means must be found to buffer the scientific teams from the untoward influence of rapid and marked political changes. The failure to provide adequate support now for environmental and occupational health research will result in added costs later. These added costs may be in the form of retrofit control technology, unnecessarily restrictive regulations or ill health. I urge you to carefully consider the options and to look beyond the FY-1983 budget. If the choice is to elect the short-term gain of reduced research funds, then the decision should be implemented with extreme care to minimize the long-term costs.

APPENDIX B

R. O. McClellan

February 22, 1982

SOME COMMENTS ON THE MANAGEMENT OF RESEARCH IN EPA

Let me begin by stating the obvious -- management of research organizations is a complex and difficult matter. Research is conducted to gain new knowledge, thus in the conduct of even the most directed and applied research there are uncertainties. Uncertainties as to the answers that will be obtained and uncertainties as to how much effort will be required to yield the desired new knowledge with an acceptable degree of confidence that the answer is right. Because the right answer is not known beforehand and the value of the answer may not be readily quantitated, it is frequently difficult to measure research performance.

The fact that management of research is complex and difficult does not in any way excuse the need for management -- indeed, it increases the need. This is especially the case within a regulatory agency which has primary need for research that is relevant to the regulatory process. Research within the EPA must be conducted in a way that contributes to sound decision making. What should or should not be regulated? If regulated, at what level should standards be set? What population is at risk? What media should be regulated? If regulations are to be established, where should they be applied -- at the plant, at the tail pipe, locally or regionally? What measurements should be taken to assure compliance? Over what time period should concentrations be averaged? The list goes on and on especially in an agency whose legislative mandate is derived from more than ten major laws.

Because the list is long relative to the necessarily limited resources available, it is obvious that priorities must be established and the resources must be used as effectively as possible. This requires careful management and planning.

I would like to briefly consider with you several aspects of research management and comment on them relative to EPA.

1. Identification of information needs is an absolutely critical initial step for research management in a regulatory agency. This can only be accomplished if there is proper communication between personnel in the Program Offices and the Office of Research and Development (ORD) with mutual agreement reached as to what information is needed and when it is needed. Unfortunately, the ORD program in the past has not been as effective or responsive as it might have been because information needs were not clearly identified. In other cases, needs were identified but officials outside of ORD choose to initiate research on their own (outside of the ORD structure) without adequate attention being given to experimental design and quality control.

I am encouraged that the research planning committees now being used in EPA have brought the Program Offices and ORD personnel together and established communication links that did not exist in the past. I am concerned, however, that the Committees appear to have focused excessively on the short term to the exclusion of the long term, they have become large and cumbersome, overly concerned with details that are best left to laboratory managers and scientists and may not involve some of the Agency's best working scientists.

In considering information needs, greater recognition should be given to the fact that regulations are periodically reviewed and revised. All too frequently in the past research has been of short-term orientation related to the immediate need for establishing a standard. By definition, the only relevant research was that which would generate data useful to setting the standard. As soon as the standard was set, attention was frequently shifted to other matters. This approach resulted in the Sgency failing to initiate as much long-term research as needed for consideration in future revisions of the standard. (The short-sighted nature of this approach is readily apparent when it is recognized that a study of late-occurring disease in even a short-lived rodent species may take three to four years to complete.)

Additional consideration should be given to identifying research needs as a part of the standard setting process. For example, the Clean Air Scientific Advisory Committee has recommended the use of a "Council on Research for Standards Development" for this purpose.

2. Identification of research resources that can be used to develop the necessary information is a logical next step. In the case of EPA, several options are available for the conduct of research; in-house, in other government laboratories under interagency agreements, or in university or private sector laboratories under contractrs, cooperative agreements or grants.

In considering the conduct of research in-house, it is important to take into account the facilities, equipment and personnel available. By and large, EPA has adequate facilities that are well equipped relative to current needs. The major constraints to the in-house conduct of research are personnel ceilings and the mix of personnel skills available.

Stringent personnel ceilings have been a key factor in fostering the development of an extremely inefficient system for doing research at EPA. Specifically, many EPA laboratories are operated with a mix of government employees and contractor support personnel. The interactions between the two groups; the government employees on the one hand the contractor employees on the other, are strictly controlled by government regulations especially if auditors are at hand. Needless to say, with this type of an operation it is difficult to create an atmosphere of team work that is essential for performing high quality research in an efficient manner. I am sure each of you can appreciate this problem if you consider how well your own office or campaign would work if half the individuals were placed on the payroll of a contractor and you obtained their services by periodically sending task orders to the contractor for whatever work you wanted the contractor to carry out.

There are several possible solutions to the problem; (a) increase the personnel ceiling to a level commensurate with the work load, (b) reduce the use of support contractors and use the dollars saved to fund research by grantees or contractors that carry out total research projects, or (c) decrease the number of government employees further and use the available funds to contract with universities or private industry to operate the research programs within government-owned facilities or under grants or contracts in their own facilities.

The point I wish to make is that I think research can be carried out most effectively and productively when it is done within a framework that promotes team work. The team needs to be involved in identifying problems, developing research plans, conducting the research, and analyzing, interpreting and reporting the results. Good research can and has been done by government employees, grantees and contractors. Needless inefficiency is introduced when what should be a team is fragemented in this case in an attempt to circumvent the problems created by the personnel ceilings.

3. Objectives, goals and plans must be established for the effective conduct of research to meet identified information needs. In the past this has been a major weakness in the ORD management system, primarily because information needs had not been adequately identified as a base for developing objectives, goals and plans. As information needs have been better identified, there has been some improvement in this area. However, substantial improvement is still needed especially to integrate planning into the overall management structure. This should include shortened and clear lines of communication to the laboratories where the research is to be accomplished. If this is done scientists and supporting staff should have a clearer understanding of their eole and what is expected of them and should be able to work more effectively and efficiently.

When I note the need for better planning, I am not calling for more detailed plans from EPA headquarters. Quite to the contrary, I am calling for better strategic plans that provide a basis for delegating the development of detailed tactical plans to the research laboratory managers and scientists.

4. Well-developed research plans can be implemented in an effective and timely manner, especially if laboratory scientists have had a role in developing plans, goals and objectives. Sometimes in the past, laboratory scientists have apparently not had an opportunity for adequate participation in planning and thus, they received requests that they viewed as unrealistic in content or timing. Once strategic objectives are established, it would seem appropriate to delegate as much responsibility for detailed planning and plan implementation to the laboratories as is possible. This should include increased latitude for the utilization of assigned personnel. If this approach were taken, it should be possible to reduce the number of headquarters personnal and increase the relative number of Agency employees that are actively involved in the conduct of research.

5. Reporting and monitoring of research performance with feedback to those who will utilize the new information and to the responsible managers is an essential element of managing a research operation. This feedback loop has not always been in place. I am encouraged that provision for such feedback was an integral part of the peer-review research grant program that was started just over 2 years ago. As a part of that program, grantees participated in a Scientific Symposium in November 1982 to report the findings from their EPA-sponsored research to the peer-review committee, to other grantees and to EPA staff. Unfortunately, this total program has been sharply curtailed in FY-1982 and appears to be scheduled for termination in FY-1983.

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6. Use of research results in the regulatory process is the desired end product of the research process. There are some examples of research, e.g. the results of the diesel exhaust emissions program, that had a definite impact on the Agency's regulatory decisions. There is other research that has had much less obvious regulatory impact.

One way in which research is used is in the development of criteria documents that are an integral part of the standard setting process. Parenthetically, I should note that I have been impressed by the improvements I have seen in recent years in the criteria document improvement process, for example the document on sulfur oxides and particulate matter and the associated staff paper on particulate matter. In my opinion, the best products have emerged when the primary input came from working scientists both from within and outside the Agency rather than "beltway bandits." I personally believe that even more EPA conducted or supported research would be included in the criteria documents if the Agency's research program had a longer-term outlook.

To summarize, EPA has adequate research laboratory facilities that are very well equipped. As in most organizations, the personnel have varied scientific scientific and managerial capabilities. They represent a resource that has not been used to their full potential. With a continual decrease in personnel, major problems may be expected in attracting high-quality scientists with contemporary training.

Improved communication between ORD and the Program Offices resulting from implementation of research planning committees has had a positive effect. Further improvements are needed in planning, especially long-range planning and in the integration of planning into an overall management system. Increased emphasis should be given to managing within a framework of objectives, goals, plans and performance (results) indicators. Responsibility for implementing research plans should be delegated to laboratory directors and their staffs with increased accountability for performance. Every possible effort should be made to minimize the size and clarify the functions of the headquarters staff while shortening the lines of communication between the laboratory staff and the Assistant Administrator for Research and Development.

Mr. SCHEUER. All right. We have some questions for you and Dr. Corn after Dr. Corn has finished his testimony.

Dr. Corn, as I said before, your testimony will be printed in its entirety at this point in the record, so why do you not take about five minutes to sum up the highlights and refer to anything you have heard today from the other witnesses and then we will have some questions for you.

## STATEMENT OF DR. MORTON CORN, JOHNS HOPKINS UNIVERSITY

Dr. CORN. Thank you, Mr. Chairman, and members of the committee.

My association with this agency precedes its name. I was associated with National Air Pollution Control Administration in the end of the 1950's; I have had research grants from them; I chaired a research grants committee of NAPCA. I served on the EPA Science Advisory Board. I am here today because of deep concern over the projected plans for funding of research and development in this agency.

The other input that has contributed to my testimony is that I served in the Ford administration as Assistant Secretary of Labor for OSHA, so I am somewhat familiar with the decisions a regulator must make.

The need is for more, not less data for the regulator. The adversarial nature of regulation stems from the fact that the stakes are large, the decision base is poor, and extrapolation is great. Therefore, there is controversy because we have not convinced those who have to adhere to regulations, of the need for them in the first place.

Having said that, it becomes a question of what type of research is needed. In terms of management of research, the inadequacies of EPA's management have been documented many times. In fact, I served on a committee for Health Effects Research in EPA that gave its report to the Science Advisory Board in 1978. I re-read that report prior to preparing this testimony; it still reads well.

The Agency has had a difficult time with epidemiological research but it desperately needs epidemiological research. The answer to that dilemma is, I believe, that the funds must be allocated, but it must be done by others. The Agency has one Center of Excellence for Epidemiology in Pittsburgh; it needs others.

The Agency has started a peer review grant system. Perhaps the greatest tragedy of the present budget is that it plans to eliminate peer review grants in the health effects area when it has just really begun to pay off. Of the 33 grants awarded, a little over $3 million, a very small amount, 22 of the new investigators never did any research for the EPA; the agency has begun to attract them. The stability of funding will insure that you get such investigators; with instability you will lose them.

The performance of research in the EPA is a dual function. The program administrators finance it or purchase it and the researchers, in essence, bid on it. There are ways in which that process could be improved by giving more freedom to the research component. The regulators have short-term guidelines and the research-

ers long-term guidelines. The program directions in EPA are well chosen. The research, according to media, is needed. We do not know, and I stress this in my presentation, the alterations that go on in the transport of pollutants in water; we hardly know anything about the interaction of pollutants in the ground from hazardous waste disposal, and we know nothing of the potential health effects to people in proximity to these dumps. The same is true with air, where we have dealt with it on an agent-by-agent basis and we are really on very shaky ground with multiple pollutant interactions for a wide variety of persons in the population. So, the decrease in funding for health effects research, according to media, is in the wrong direction.

Many of the hardware areas of EPA, mainly the development of instrumentation, monitoring methods, and the gathering of environmental data, I tend to think can be served by contractual mechanisms. They are straightforward tasks, and if some choices have to be made, those are areas that I would give less priority to.

Many of the problems I have stressed are shared with other agencies: OSHA; the Consumer Product Safety Commission; and the Department of Energy. All are concerned with low-level chronic exposure to agents and coordination there with these agencies would assist. Some progress was made in this direction during the administration of President Carter, but the Interagency Liaison Group formed has been disbanded.

I mention the need for gathering data on the effects of pollutant changes on the environment and on health, and indicate that the EPA can now tell us how much we have reduced pollutants and emissions; how much we have reduced pollutants in the outside air; and how much we have reduced pollutants in water. They cannot tell us the effect that this has had on our health. There is a difference between these two achievements.

The driving force for research is the impact on health, and not necessarily on the cataloging of the reduction of emissions.

Mr. SCHEUER. Excuse me. They can catalog the reduction of polluting emissions in one area, but so far as acid rain is concerned, I am not sure they can predict the reduction of fallout of acid rain 1,000 or 1,500 miles away.

Dr. CORN. No, in that area they cannot.

Mr. SCHEUER. Dr. McClellan expressed the hope that acid rain will not be a problem in 10 years. I hope when I ask him the question, he will elaborate on that hope. I hope that he will infect me with his confidence and enthusiasm, because we do not see a light at the end of the tunnel for acid rain, but I am sure he does, and I look forward to asking him about that.

But, the problem that we have in predicting changes in polluting effects from a given change in the production of pollutants here, the predictable change in polluting effects 1,000 miles away, is one that puzzles us very much; apparently it is not a straight linear relationship.

Dr. CORN. No, and I could not help but think as I listened to that exchange in the last hour that, in terms of the history of public health, the demand for a relationship between benefits and input never existed in public health; we cleaned up the environment before we had a microbial theory. The history of the sanitary move-

ment was a dissatisfaction with dirt and some inclination that it was associated with disease; no proof, no benefits.

We learned about microbes in the 1880's; the cleanup started in England in the 1850's. Almost every development in public health was followed by elucidation of the mechanisms. So, I am quite impatient with today's demands for a second decimal point justification of control measures. I think we know one hell of a lot about the effects of tobacco, to move on it. We know an awful lot about acid rain to move. Then, you say, "How much?", as you said in the last hour. Certainly in the first stage of control, we know the curve of control versus efficiency is exponential and if we know the first stage is 85 percent control, then let us go for 85 percent. We know enough to do that rather than permit emissions without further control. So, there are approaches to these questions without having all the data. As Dr. McClellan says, the data will take years to come in.

The amounts of money we are discussing are small. We recently completed a study in Memphis, Tenn., sponsored through the Commissioner of Health in response to citizens' concerns: "Are Hazardous Waste Sites Affecting Us?". We designed a study. The estimated costs of a study in the vicinity of one hazardous waste site, the Hollywood dump site, was a little over $3 million. The total value of the whole research grants program of this agency in health is about $53 million. The study would take 45 months. The citizens wanted the answers in a short duration, the Commissioner of Health did not have $3 million. A multidisciplinary group of scientists told that community that it could not be done in less time and for less money; these are complex questions. Now, we think they should move on that waste site. We think they should contain it; we think they should top it; we think that they should restrict further usage of it; but we do think there is an obligation to study the people who have been exposed to it to answer they question namely, "is it affecting us?"

Another source of technology, and I think it ought to be brought up, is going to come from abroad, and that was a major change between my 1972 study for EPA and the 1978 study; that more technology is coming in from abroad. The U.S. industry of environmental products and services is losing its leadership—the United States is losing its leadership.

In addition to characterizing this industry as I have and many other subjects in my report of 1978, we also did a survey on Mr. Anthony's industry for their views on what EPA's research should be in support of technology. I think they believed that the Federal Government should be doing most of the research on health effects; the private industry should do most of the work on hardware development—not basic technology development—but the hardware to carry out that technology, and the Federal Government would be needed for major demonstration projects, because companies of their size could not afford those kinds of up-front costs.

In conclusion, I must voice my concern about the growing research and development gap that I see between the future demand, and I believe that is real, for new control technology and the ability of our economy to supply that technology. While the private sector might, logically, focus on regulation, it has never given a

very high role to science. The SAB is advisory to the administrator; some administrators have used it, some have not. How you create that respect for science within the agency, I think perhaps we should look to different types of administrators; they have consistently been of legal background.

I summarize, at the end of my testimony, but I have dwelled on the points, and I have already utilized more time than you allocated, so I will not repeat the summary.

I would be pleased to answer questions.

[The prepared statement of Dr. Corn follows:]

STATEMENT

by

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Baltimore, Maryland 21205

Members of the Committee:

My association with the Environmental Protection Agency goes back to its predecessor organizations. I was a graduate student at Harvard University supported by an Air Pollution Traineeship during the 1958-60 period. I held research grants of the National Air Pollution Control Administration in the early 1960's and during 1968-71 chaired the Research Grants Advisory Committee of that agency; it was a peer review body which distributed approximately $9,000,000 per year for research grants. During 1971-73 the Environmental Protection Agency funded my research to study the effects on cats of inhaling aerosols and pollutant gases alone or in combination. I served on the Health Effects Committee of the EPA Science Advisory Board during 1978-81 and was a member of the Health Effects Research Investigatory Committee of the SAB during 1978. Thus, my association with this agency has been a long one. I am deeply concerned,more concerned than ever in the past, over the current actions which drastically reduced research funds for environmental health research and proposals to further reduce these funds.

Another aspect of my background that is relevant to this testimony is that I served as Assistant Secretary of Labor for Occupational Safety and Health during the Ford Administration (November 1975 - January 1977). With the exception of the brief tenure in the Labor Department, my entire professional career has been devoted to research and development and the application of this knowledge to graduate education and problem solving in environmental fields. My comments address the major issues highlighted by the Subcommittee.

Resource Allocation for Environmental Research

There is enormous difficulty with implementation of environmental regulations because the data base related to definition of the problems and their solutions is so limited. We understand relatively little of the long term, chronic effects of environmental pollutants. Many of our approaches to control of these pollutants are based on methodologies developed in the past. One could say that there is no more effective way of blocking regulation in environmental fields than by curtailing research, because without further research and development there will continue to be adversarial relationships developed in response to promulgated regulations because the stakes are great and,of necessity, the regulator must rely on large areas of data uncertainty. Therefore, my first and primary point in appearing before you today is that rather than decrease funds for research and development in environmental areas,a cost-saving investment would be to increase these funds. We are attempting to regulate in the presence of widespread ignorance of the micro-interactions of environmental pollutants with the population at risk and the ecosystem. Having said that, we must now focus on the management of funds dedicated to research and development in this field.

Management of Research

The Health Effects Committee of the Science Advisory Board undertook an indepth study of research on health effects in the Environmental Protection Agency. That report, dated February, 1979 was published by the Agency. I will not dwell on the numerous inadequacies of EPA research; they have been well documented not only in our report but in other reports. There is a bonafide question as to whether or not EPA can conduct fundamental research in the health effects of pollutants. Epidemiological research conducted by

EPA has been poor and there is no indication that the agency can muster a respectable effort. This research should undoubtedly be farmed out to other agencies or to the universities. The EPA has not performed well in fundamental areas of laboratory research related to health effects. Some of these areas are reproductive effects, mutagenic effects and development of relevant screening tests for chemicals.

Beginning in 1980 the agency instituted a peer review procedure to attract outstanding scientists to perform work in these areas. I am dismayed that the projection of funds for this effort in 1983 is zero dollars. The peer review grant process has proved that the agency can attract researchers of highest quality to work on problems relevant to EPA. Within its own laboratories the agency has be . twisted and constantly redirected in efforts by program administrators pressed by regulatory deadlines. In EPA, research programming and performance is conducted by two different groups, namely administrators without scientific backgrounds and researchers, respectively. The intramural peer review research committees formed in recent years showed that the research process can be improved. EPA research can be further improved by preferentially distributing the allocation of funds to peer review grants. Agreements with other federal agencies that have distinguished themselves in health effects research would provide EPA with administrative mechanisms to manage those funds in other laboratories. These mechanisms would provide a small core of scientists working in EPA to augment their effectiveness through liaison responsibility with other agencies.

Program Directions

The areas of EPA research according to media are well chosen. We do not understand many aspects of air pollution, including interaction of pollutants. Many aspects of transport of pollutants in water, their alteration and their effects are still unknown. The field of solid hazardous waste is in its infancy. We do not know the interaction of pollutants in solid media nor do we have any idea of the long term effects of exposure. The entire area of toxic substances control has hardly been developed at EPA. The extrapolation of chemical properties from structural considerations, an area desperately needing research has hardly been developed as a science. Indeed, most scientists are skeptical of the current state of the art.

Many of the "hardware areas" of EPA needs, namely development of instrumentation, monitoring methods and gathering of environmental data are possible through contractual mechanisms with the agency. The relatively straightforward tasks involve ingenuity, but not necessarily research capability. The agency has had extensive inhouse efforts in these areas that could be left to the private sector.

Many of these environmental problems are shared with other agencies. Thus, the Occupational Safety and Health Administration, The Consumer Product Safety Commission, and The Department of Energy all have needs in understanding environmental impacts of physical and chemical agents. Coordination of research among agencies is virtually non-existent. Each agency has pursued its own program. EPA could take the lead by

managing the process of assignment of research. Again, there should be a healthy contribution of each agency to a peer reviewed grant program, grants in which the investigator would compete with others to perform investigations in subject areas defined by the agencies.

The process of programming research to meet anticipated needs is a very delicate one and there will be errors in judgment. However, it is possible at any given time to select certain subject areas where there are promises of scientific or technical breakthrough, areas relevant to environmental regulation. EPA has lacked this longer term research planning process. If the agency is to plan effectively it must obtain the needed research results. Research need not be performed within the agency, but the appropriate ties must exist to those research organizations which will deliver results, be they federal investigators or those at universities, research institutes, etc.

I serve on the National Advisory Committee for Health Statistics, which advises the Secretary of Health and Human Services. This Committee made a major effort to determine if there are any broad based data bases for gathering data to estimate effects of environmental changes in this country on the health of the population. We found that there is not one sound data base for this purpose. A National Academy of Sciences committee studying the same question reached the same conclusion. Somewhere in its research and development efforts EPA should be thinking about the accumulation of data on environmental impacts, just as we now routinely collect vital statistics on infant mortality and the adult death rate. The vital statistics of the future will indeed include the effects of environment on health. In its broader sense, the disease profile of this nation is changing from one of

infectious disease to manifestations of ill health brought about by environmental factors, the latter considered in the broadest sense, including smoking and style of life, for examples. We will regret not laying the ground work for collection of these data. In a very real sense, I am stating that EPA can now tell us if suspended particulate matter has decreased in U.S. air during the last ten years or if certain specific pollutant emissions have decreased. The agency cannot tell us if the impact on the population of these reductions has been one of health improvement or not. Nor will it be able to answer this question in ten or twenty years. We are probably at a point in time where such a data base can be developed.

Role of Science in the EPA

Permit me to dwell a moment on the role of science in the EPA. EPA has been and is managed by administrators with primarily legal training. The prevailing philosophy has been that regulation is "what the traffic will bear." The agency does not respect and has not relied heavily on scientific input. The Science Advisory Board is advisory to the administrator; different administrators have utilized it to different extents. Scientists in the agency are full aware of the limited degree to which their research results and the advice of other scientists have been utilized in regulations. Thus, the entire climate of science in the agency must be altered if quality scientists are to be recruited and retained. It is for this reason that I earlier recomended liaison with institutions that have a stronger reputation for scientific research. After ten years many in the scientific community do not believe such an effort of building research competence can succeed on a large scale in the EPA. The current practice of internal peer review is superfluous and

viewed by many as an effort to prevent EPA research results from reaching rapid publication.

In summary, the points I wish to make are as follows:

1) the need for scientific research and development in the environmental fields is great. The past inadequacies of EPA research and development performance does not decrease the enormous needs for understanding of Environmental Protection Agency concerns if the statutes the agency adminsters are to be intelligently, efficiently and effectively administered.

2) EPA does not have a distinguished record for performing research and development, but mechanisms for obtaining results of research and development required by the agency have not been examined imaginatively. Funds for EPA research should not be decreased; rather different ways to effectively utilize these funds should be developed. Liaison with other research and development units of the government and the Peer Review Grant Process are two ways in which research can be upgraded.

3) I have stressed the inadequacy of the data base to regulate intelligently in the environment and have indicated that until good data are available adversarial controversy will abound, because regulatory

assumptions are many and the stakes are high. Areas highlighted for emphasis and research are health effects of pollutants, particularly chronic long term effects; screening tests to classify the many compounds which must be dealt with under toxic substances legislation; alterations and changes during transport of emitted pollutants in air and water; control technology for pollutants (we are using control technology that is decades old and little progress has been made in recent years); hazardous solid waste research. We know relatively little of the exchange in the ground of complex pollutant mixtures and nothing of the potential effects on health of living in proximity to these waste or dealing directly with them. This problem is part of the larger problem of chronic exposure to low level concentrations of pollutants but it is manifested in a more complex form in hazardous waste exposure.

There are undoubtedly other areas of research that are deserving of resource allocation. As a former regulator I am appalled at the inadequacy of the data base to make intelligent regulatory decisions involving hundreds of millions of dollars and in many cases billions of dollars. The curtailment of the research funds to increase the knowledge base for these decisions is a short term, foolish decision. On the other hand, if one is interested in thwarting regulatory efforts on environmental matters there is probably no better way to insure increased controversy and lack of progress than by cutting research and development funds, as this administration has done and proposes to further do.

Thank you.

Mr. SCHEUER. You are both very thoughtful and stimulating. It is a little depressing that you both agree completely with the consensus of this committee. We are utterly nonplussed at the thrust of this administration in downgrading so drastically the EPA, and, as I say, we cannot take issue with anything that you have said.

Dr. CORN. Mr. Chairman, my last sentence—and I can only conclude—that there is no better way to insure increased controversy and lack of progress on environmental regulation than by cutting research and development funds, as this administration has done. There is no better way to tie up progress. That is why we are in court: because the data base is poor and there is so much at stake. If there is a continued weak data base all of these issues will be decided in court.

Mr. SCHEUER.I do not think there is any better way of further frustrating the business community because there is a demand out there. An insistent demand for preserving health and preserving the environment and in the absence of ongoing research that gives us the knowledge base to regulate intelligently and to establish intelligent standard setting, we are going to be sort of functioning in the dark and doing the best we can with a grossly inadequate knowledge base. We are either going to err on the side of not controlling enough or we are going to err or the side of controlling too much in a way that the costs will be perhaps out of proportion to the benefits.

It seems to me that the thrust of this Reagan administration is getting the Government off people's backs and off the backs of industry. In terms of environment and health controls it seems to me that the best way to reduce the intrusion of Government is to give the Governors, the standard setters, and the regulators the knowledge base to fine tune their thinking so that they can regulate optimally to make sure that every dollar of regulation produces more than a dollar of benefits. I share your frustration.

You mention that numerous Federal agencies are involved in environmental health research. The one question that we would want to ask you is: How can these research efforts be brought together more effectively in terms of standard setting? Now, I know that Dr. McClellan said that there was not much a target of opportunity through further coordination of the work of the various agencies. Might there be a clear need for a statement of responsibility for each of these programs in support of setting health-based standards, and, if there is such a need, what responsibilities should be assigned to each of the agencies involved?

Dr. CORN. I do believe it is not a question of can we or can we not coordinate; the Government must coordinate some efforts. I experienced it firsthand in the regulation of coke oven standards: had we at OSHA not coordinated with EPA, we would have promulgated a requirement that would have precluded a requirement of the EPA. The physical characteristics of the coke oven battery would not have permitted both requirements, both of which were arrived at by review of testimony at hearings of each agency, respectively. So, the coordination, in terms of regulation, is crucial. That backs up to the coordination of research for providing the data base. It is not a question of: "Does it look promising"; it must be done.

As I mentioned, the Carter administration made a very good start with this coordination and I thought it was taking root; that must be continued. I do not know if the Congress can superimpose it if the Executive Office does not coordinate, but the agencies tend to go their own way and there needs to be an external hand to force them to share the directions they are moving in. There is tremendous overlap of effort. In addition to overlap, holes or missing data develop. That can be coordinated, but it will not be done naturally. You see, the regulator is mesmerized by timetables and deadlines and it takes extra time to coordinate.

Mr. SCHEUER. How should the coordination be effective? Who should be the lead horse? Do we need intervention from the legislative branch in terms of statutory assignment of responsibilities, or can that remain in the executive branch? If so, where? Is it the President's science adviser? Who is going to assign responsibilities for the appropriate agencies to cover their mission involving a particular slice of the pie? Where is that decisionmaking going to be and that coordinating function carried out?

Dr. CORN. Normally it would be the executive branch. Where the executive branch does not do it then the Congress must do it; that is the oversight responsibility.

Dr. MCCLELLAN. Well, I think that is clear. I think it should be exercised by the executive branch. I think it should probably come out of the office of the President in terms of the President's science adviser; we have seen that in the past when we have had a strong President's science adviser. We have to recognize that that structure has changed and certainly that is not the way it is going today.

I agree in terms of the usefulness of coordination and certainly the interagency liaison regulatory group did provide some of that in the last administration. I guess that what I would like to see is something that has a fairly soft hand to it, if you will. There is a balance between coordination, in terms of the interest of efficiency, and also insuring that the agency fulfills its own responsibilities and, if you will, a degree of competition between programs. There is some desirability for an investigator to have the opportunity to go to more than a single agency and try to sell his idea for something because sometimes that idea, even when there are good staff there in terms of the agency, it falls on deaf ears. I can cite more than a single example where it has been useful for the investigator to go to another agency to sell the idea.

What we are talking about here is the kind of coordination that is not quite that rigid, that does not pull it all together and say: "This is the way it will be," but, perhaps, a little softer touch to it as with the interagency regulatory group.

If we are going to talk about cancer policy, we cannot have five different cancer policies; one from FDA, one from OSHA, EPA, one from DOE, and one from NCI. They have to come together and we have to talk about it and recognize that there have got to be some common ties across agencies.

So, I do not want you to think that I am opposed to it. I think we have come a long ways in terms of our coordination efforts already. It would appear that last year we had some backsliding.

Mr. SCHEUER. In the last year we not only had some backsliding in coordination, but we have had backsliding on the will of the administration to encourage and support ongoing science and technology and important research in the environment and health fields, such as we are talking about today in the field of energy. While they are going forward with a crash program of developing energy alternatives to Persian Gulf oil, they are cutting by 75 percent considering the 1981 to 1983 budget. They are cutting research and development by 75 percent. Now, this seems utterly bizarre. If a banana republic did this you would say that they ought to be held to higher standards of responsibility than that. So, when you talk about a low-profile level of coordination, that assumes the will to coordinate. That assumes that there is a degree of respect between the various agencies—respect and cooperation. That assumes that somewhere out there in the executive branch there is some leadership and some will to proceed with ongoing programs that will produce the knowledge that will enable us to make breakthroughs in science and technology and harness all these extraordinary forces that we seem to be able to harness in a way that is consistent with human welfare, a safe planet: a decent environment and a safe environment.

Dr. MCCLELLAN. I would agree with you. A little bit of my reluctance on the coordination side comes from my understanding in part of how this budget was developed. I do not know for certain, but I have a feeling that in the energy area, that one individual in a highly placed position here in town and his staff went to one agency and said: "There is a lot of overlap between your program and that of another agency. I think we should take a substantial reduction in your program." Then, he went across town to the other agency and said: "It looks like your program has a considerable amount of overlap with that other agency. I think we had better take a substantial reduction out of your program. " So, I do not think that it is quite by accident that he ended up taking a cut from both of them.

If you look at the energy budget in the EPA, it is reduced by a substantial amount, as you noted. If you look at the health and environmental research program in the Department of Energy, it likewise is reduced by over 20 percent. But, it goes beyond those figures. The message from the Office of Management and Budget is to hold the line or to increase your nuclear energy research, discontinue research in the areas of conservation and solar and phasedown and phaseout research that is related to gasification, liquifaction, and combustion of coal. So, we are not talking just about the dollars but we are talking about the shaping of a program. I strongly agree with the chairman that I think this is a very shortsighted view. I think that we lay ourselves absolutely open in terms of our dependence on liquid fuels from abroad. We will not have the knowledge base that we need if we have to put in place a program to provide us liquified fuels from coal, for example, in the next one or two decades. You commented in terms of banana republics. I do not need to remind you that in terms of our current international crises we have some that are fairly close to home. We have two gulfs to be concerned with; not only the Persian Gulf through which a lot of petroleum moves, but we have the Gulf of

Mexico through which a lot of petroleum moves. So, we should not be overly concerned with just that one gulf a long ways away; we are surrounded by those gulfs. This Nation is simply not going to be able to get itself off of a liquid fuels' diet in a decade or two. Liquid fuels are a part of life in this country: We all enjoy automobiles; we all use transportation, we need it to transport goods; it is an essential part of our economy. I am, personally, greatly concerned that we are not going to be able to support the health and environmental research program today that is needed if we are going to build a program for gasification, liquifaction, and improved combustion of coal down the road two or three decades.

Mr. SCHEUER. Could you elaborate on your remark before that you hope that acid rain will not be a problem in a decade or so? Infect me with your confidence.

Dr. MCCLELLAN. OK. I would like to think that we can put our minds to solving a fairly well-defined problem—acid rain. We have got a lot of good people today in the field. I think that if given adequate support research will provide the information base for national decisionmaking. It is my understanding the budget calls for increased funds for research on acid rain. The point I wanted to make is that we may be able to solve acid rain over the next 10 years but how about the other problems that were not answered; the problems that we know are going to be showing up next year or the year after. The kinds of exploratory research that we need to be doing today, for example, in the synfuels area, so we can avoid an acid rain problem. It is a tragedy that we have got the acid rain problem before us today when we already have a huge industry built up out there. I think most of us have a hunch that the only way we are going to solve the problem now is with some kind of a massive retrofit technology that is going to require a huge capital expenditures. Unforunately. That is going to drain capital that you would like to be putting into new plants and new facilities.

My optimism was that I think we have sufficient numbers of good scientists in this country who, given adequate support, will define the scientific dimensions of the acid rain problem. Regulators may not like the scientific information that comes out; it may demand the use of retrofit technology if acid rain is to be controlled and that may be a very unwelcome kind of an answer. A major concern of mine is that the scientists be given the freedom to pursue the scientific problem without being shackled by any preconceived notions as to what the problem is or is not.

Mr. SCHEUER. Or where the payoff is?

Dr. MCCLELLAN. Yes. I am very concerned in terms of some of the words I have been hearing, in terms of papers circulating around Washington in the last 3 or 4 weeks about how the problem may not be there, or that we are headed in the wrong direction, or whatever. Too early a locking-in, in terms of a possible solution to a problem, can sometimes be very deadly; you may be on the wrong track.

Mr. SCHEUER. Dr. Corn?

Dr. CORN. I was going to shift the subject somewhat to a Supreme Court decision that has had a profound impact on those in the field of public health.

The decision that I am referring to is the decision on the cotton dust standard of the Occupational Safety and Health Administration. What the public health field believes that decision is saying, and the court upheld the regulation almost in its entirety, is that the mechanism of bysinnosis is still unknown. There are those that argue that lung disease due to cotton dust exposure is an allergic response, immunological in nature. There are those that argue that it is a classic pneumoconiotic response. Be that as it may, the agency can document the effect of this agent and the court ruled that, "Yes, some small businesses are going to suffer, but as long as the total industry does not suffer, and the impacts are on certain individual firms, that was the intent of the Congress in bringing about control of some of these hazardous agents." It says to me and to others that you must document that you have a problem and then you can regulate, even though some businesses will fail due to regulation.

Therefore, I come back again to the health effects research in the Environmental Protection Agency: of all the subjects, the whole laundry list of what EPA must research, it is the premier one. If the EPA cannot document there is an effect on health, there is going to be tremendous disagreement about where we spend our money on controls.

Given that an agent can have a significant impact on health, as a society we will move forward. The controversy over ozone was over the demonstration of an effect at the level the standard was set. The controversy over sulfur dioxide hinges on the same question: Are we setting this standard too low? Does sulfur dioxide act with other materials—suspended particulates? That is the type of research that just has to be bolstered up and not cut back if the standard is to remain intact.

Mr. SCHEUER. Well, I wish you two gentlemen were in the executive branch making some of these public policy decisions. I am going to ask unanimous consent that we submit further questions to you in writing and we will hold the record open for your answers.

Thank you very much for your splendid testimony.

Before the last panel, we are going to declare a recess for about 6 minutes.

[Whereupon a recess was taken at 4:25 p.m.]

Mr. SCHEUER. Let us continue. We will hear from Mr. Toby Anthony, from Research-Cottrell, Inc., and Dr. Terry Rathermel of Arthur D. Little, Inc. This is the last panel in the afternoon so we can take an extra few minutes.

As I have said before, your prepared testimony will be printed in full in the record so why do you not take 5 to 7 minutes each to sum up your testimony and, as I said before, comment on anything you have heard this afternoon that you think deserves elaboration. I am sure I will then have some questions for you. Why do we not start with you, Mr. Anthony?

## STATEMENT OF TOBIAS ANTHONY, RESEARCH-COTTRELL, INC.

Mr. ANTHONY. Thank you, Mr. Chairman, and members of the staff.

I would like to summarize the testimony that I have submitted to confine my oral statement to 5 or 10 minutes.

For years our chairman has been promoting a principal of basing our economy on coal in order to achieve energy independence. For almost 70 years our firm and several of our competitors have been investing our own funds in the research needed to burn coal cleanly. When I say to burn coal cleanly, I am talking about removing macroparticulates and sulfur dioxide, and that is essentially the air pollution control challenge today; only those two pollutants are being addressed by the marketplace, so to speak.

All the major pollution control equipment used to clean up flue gases emitted from coal-fired boilers were developed by the private sector before the Clean Air Act was passed in 1970. During the seventies the Federal Government began to invest in research and development; first, to assure that the equipment could be upgraded to meet new and more stringent emission limits called for by the Clean Air Act of 1970 which were then tightened in the Clean Air Act of 1977.

Since our market is now cycled by political rather than engineering demands, since the periodicity of political demands in unpredictable——

Mr. SCHEUER. "The periodicity?"

Mr. ANTHONY. Yes, the fact that it takes 10 to 13 years to achieve a payback in this type of research and development, but since the Clean Air Act is reviewed every 4 years this casts great doubt on whether the technology we will develop will be obsolete or not in that interim period of time. That means that emission standards in new source performance standards can be changed. Consequently we have experienced where much of our equipment was designed and then had to be removed from the market simply because the standards were ratcheted up. That is the big reason that I feel that the private sector will not invest substantially in long-range research and development to burn coal cleanly in the future.

Mr. SCHEUER. Forgive me for interrupting you—we will keep it a little informal. How do we get around that? You know, when the Japanese Government wants to do something meaty, the Ministry of Industrial Trade and Investment gives them a grant of 25 or 50 million hours to do the research and development to get into computer chips or robotry, or whatever. Then they quietly arrange for them to get bank financing for 10 or 15 years. I was over in Japan as a guest of the Japan Productivity Foundation last August and the head of the Yamasaki Tool Co. told our group of several Senators and Congressmen that their bank financing was over a 10- or 15-year period and for the first 10 years they lost money every year and nobody cared. The 11th year they made a little, the 12th year they made a fair amount, and the 13th year they came out like gangbusters and they have been wiping us out of local trade in robotry ever since.

You are complaining about the fact that we have to look to very short-range profits on what should, essentially, be long-range programs, and I sympathize with you. How do we solve your dilemma?

Mr. ANTHONY. Well, I am not saying that we are looking for short-range profits. What I am saying is that a financial executive's horizon is short.

Mr. SCHEUER. I agree with you. That is the way that it is.

Mr. ANTHONY. Now, if it takes 10 years to develop a technology, then somebody has to take the risk of the first 5 or 6 years and in reference to the Japanese the financing is performed or offered by the Government. The same has to be done here. But, first, you have to ask yourself the question as to whether we do need that technology in the future and that is a very substantial question. There are some people in town who say that we do not need that technology; we have postcombustion cleanup technology right now and it works.

Mr. SCHEUER. You are talking of scrubbing?

Mr. ANTHONY. Yes. We have scrubbers that remove 90 percent of the sulfur and we have electrostatic precipitators and fabric filters that will remove 99.5 percent of macroparticulates; and that is the air pollution control business.

Mr. SCHEUER. How do we get the system to go with that? How do we give you adequate financial rewards to go with that system and do the research and development and then to produce it?

Mr. ANTHONY. Our feeling is that the Department of Energy is the place to develop the next generation of technology and that there is where the funding should occur, not the EPA, for the reason that we are talking about: no new threats. We are talking about developing technology that will make us competitive in world markets when we export our coal. The Department of Energy is ideally organized for this research. Right now they have a control technology, coal preparation and a combustion cleanup division. The objective of coal technology and coal preparation is to take a look at combustion, or precombustion technologies and trade off which of them will be the most cost effective and which will be the most reliable. They are organized to do that now. What I am saying is that the Department of Energy should take the next generation of development up to proof of concept. To do so should not require $12, $20 or $50 million per project in the order of $2 or $3 million to prove that something can be commercialized.

Once the proof of concept has been established the private sector will take it over, I am convinced of that.

Mr. SCHEUER. As a representative of the private sector you would want the Government, the Department of Energy, to do the basic research and development?

Mr. ANTHONY. No. The Department of Energy would manage the development. In other words, the work would be done by outside contractors.

Mr. SCHEUER. You would have DOE design the research strategy and parcel out the various components?

Mr. ANTHONY. Yes!

Mr. SCHEUER. But you are satisfied with the design, the research and development design?

Mr. ANTHONY. Yes.

Mr. SCHEUER. What you are saying is, "Let us get on with it?"

Mr. ANTHONY. Yes.

Mr. SCHEUER. All right, please continue and forgive the interruptions.

Mr. ANTHONY. I am saying that the private sector will not do this job on its own for the reasons I gave you before about the in-

vestment period. We have to ask ourselves a question: Should there be future generations of control technology? I say that there are two reasons why there should be.

First of all, postcombustion cleanup technology is comparatively undesirable from a cost-effective and an efficiency point of view. Now, we supply that equipment and we have been supplying this kind of equipment for 70 years. I maintain still that that equipment is not the optimum equipment for this country.

Mr. SCHEUER. Are you talking about scrubbers?

Mr. ANTHONY. I am talking about scrubbers,——

Mr. SCHEUER. As I understand it, the Japanese have installed scrubbers throughout the islands.

Mr. ANTHONY. No. They do have a substantial number of scrubbers, but we have more scrubbers in powerplants than the Japanese do.

Mr. SCHEUER. As a percentage of plants?

Mr. ANTHONY. I cannot say what the percentage is, but we have about 28,000 megawatts controlled.

Mr. SCHEUER. You say that postcombustion technology is not desirable. The technology that you would advocate would be the actual technology of combustion—that this should be made a less-polluting combustion technology. Is that what we should be looking for?

Mr. ANTHONY. Precombustion is where the ultimate answer is going to be—a superclean coal is going to be the answer. That would satisfy your acid rain problem, for example, because then you could use that coal in existing boilers without changing the boiler designs substantially.

Mr. SCHEUER. So that would save society the cost of all that retrofit—just clean coal?

Mr. ANTHONY. Comparable to world oil prices. I think that can be done. There are two technologies available today that show promise in being able to do that, one is a microwave technology and the other is electron beam technology. Using washed coal and then going into a separation using either one of these technologies—I am not quite sure which one will survive as the ultimate one—I think we can have a chemical clean coal, what I would call a superclean coal. That will take about 15 years to develop.

Mr. SCHEUER. Fifteen years to develop a superclean coal?

Mr. ANTHONY. Yes.

Mr. SCHEUER. You may have a less hospitable subcommittee chairman then. Why do we have to wait so long?

Mr. ANTHONY. We have a lot of benchwork to do to determine which is the best choice to make and it may not be the microwave or electron-beam technology; it may be another technology. I am saying that if we start working on microwave and electron-beam technology, we will find out if there is a better technology than either of those two. However, it will probably take the rest of the century at today's development pace before superclean coal will be used substantially. For the rest of this century we will depend on postcombustion technology such as a scrubbers on new coal-fired boiler plants.

To bring up another point that should stimulate our interest, the emerging coal export market offers this Nation another chance to

export technology to industrial and Third World countries converting their dependency from oil to coal. Between now and the end of this century someone will commercialize cleaner ways to burn coal, and eventually a superclean coal. But, costs of capital being what they are, it will be a foreign firm where partnerships between government and industry are routine. To be competitive with world oil, coal will have to be cleaned to levels comparable to fuel oil and burned as slurries such as coal oil, coal water, or coal alcohol mixtures in oil-fired furnaces. This could have a major impact on this cost by eliminating coal handling and storage requirements—and that gets to your acid rain question—and substantially reducing the environmental control portion of these costs to levels comparable to oil firing. Coal-water mixtures, for example, 75 percent coal and 25 percent water, burn with a flame characteristic of an oil. Or perhaps it will be pressurized-fluidized bed combustors with gas turbines, or coal gasification combined-cycle systems utilizing turbines or fuel cells that will satisfy a share of the technological nature of future ways of burning coal.

Importers of coal will be forced by exogenious factors to burn it cleanly and economically. They will not burn dirty coal for long and, as I say, I do not think that postcombustion technology will be their final method. What better products could this Nation offer as a stimulus for increased sales of all ranks of U.S. coal than a complete spectrum of new utilization technologies permitting use of coal at minimum cost and with minimal environmental intrusion.

This Nation cannot remain preeminent in solely the export of bulk material. Our successes in agriculture resulted from supplying the world's every facet of technology needed to maintain, operate, and even develop their own independent systems. Because of our extensive resources of coal, it is to our advantage to prevail in the export markets, and that position can only be achieved and sustained in conjunction with selling technology.

But that technology must be developed, tested, and commercialized here first. The Department of Energy's fossil energy coal utilization program is on target for participation by the Federal Government, but $8.6 million for control and coal preparation for fiscal year 1983 and $6.5 million for combustion systems appropriations is ludicrous. The combined appropriations for fiscal 1981 were $78 million and for fiscal 1982 were $55.6 million.

I suggest you freeze appropriations at the level of $55.6 million, which is the fiscal 1982 level, as a minimum and then evaluate results for fiscal 1984.

I apologize for the length of this, Mr. Chairman, but I will be glad to answer any questions you might have.

[The prepared statement of Mr. Anthony follows:]

STATEMENT OF

TOBIAS ANTHONY

VICE PRESIDENT

BUSINESS DEVELOPMENT

AND

WASHINGTON AFFAIRS

Good Morning, Mr. Chairman and members of the Subcommittee on Natural Resources, Agriculture Research and Environment. I am privileged, once again, to appear before your subcommittee to discuss R&D needed to burn coal cleanly.

Once before, on May 20, 1981, I testified before a Joint Subcommittee meeting chaired by you and Mr. Brown. At that time, I suggested EPA be free to work on new threats in coal combustion in support of new standards and allow DOE to develop component and systems technology. I am happy to report that DOE reorganized around the suggestion I made to you, namely, putting one person in charge of post-combustion, combustion, and pre-combustion technology development at a rank lower than the Assistant Secretary level. Now, trade-offs can be made to develop the most cost-effective future technology to assure that this nation by being coal dependent will be free of dependence on foreign oil.

That bit of history aside, I should like now to address questions put to me by your staff.

The most important statement I can make today is that I sincerely doubt the private sector will ever invest substantial internal funds for long-range R&D needed to burn coal cleanly.

The reasons are clear. First, it takes more than ten years to recover an investment in fundamental R&D, based on cost of capital, or interest rates, in the range of 10-12%. Since the Clean Air Act can change every four years, technology becomes obsolete before the payback period is realized. For example, for more than fifty years the weighted wire precipitator

was a basic technology used to control particulates from coal-fired utility boilers when reduction of 80-85% were called for. When the 1977 Clean Air Act called for 99% reductions, this type of precipitator was obsoleted in favor of rigid discharge electrodes and fabric filters. Now, it is one thing to track a customer's spending attitude in order to anticipate the need for changing technologies and an entirely different matter when an Administrator of the EPA can change requirements in a morning press conference.

A more glaring example of how political decisions can distort sound long-range planning involves Mr. Costle, former Administrator of the EPA, in a decision regarding percent reduction of sulfur oxides after combustion of low sulfur coal. From 1970 to 1979, wet limestone scrubbers were used to reduce sulfur dioxide in flue gases. When the New Source Performance Standards for utility boilers was amended in 1979, he allowed 70% reduction of sulfur dioxide from burning low sulfur coal, but called for 90% reduction when high sulfur coals are to be burned. His stated purpose was to give spray-dryers a chance to compete with limestone scrubbers. That advantage worked only too well since limestone scrubbers were eliminated from the low sulfur coal marketplace. Perhaps, the most damaging action taken by the federal government was to initiate the Synfuels Express in 1980 only to see it derailed in 1981.

We must understand the full impact of the disillusionment with government dominated markets. All of the technologies

that are now in use to control air pollution in the post-combustion phase were developed in the private sector without substantial federal funds. Electrostatic precipitators were invented seventy years ago, scrubbers were developed more than twenty years ago, as were fabric filters and spray-dryers. Federal money has been limited, essentially, to demonstration, test, and evaluation of these technologies.

The question is: who will develop the next more important generation of control technology?

I believe the private sector will limit investment to product improvement, which typically involves payback periods of three to five years, but not major breakthroughs. In effect, the private sector will be willing to assume three to five year risk periods, or roughly the cycle of change of the Clean Air Act. That means the federal government, if it expects to achieve a coal dependency policy that will be cost competitive with imported oil, will have to finance the first five years of development of major breakthroughs. Essentially, the period from test tube to proof-of-concept or pilot.

Future cost breakthroughs must occur in the combustion and pre-combustion phases. It will be more cost effective to eliminate pollution in those phases. I believe only one more technology is needed in the post-combustion phase and that is aimed at combining sulfur oxide, particulate, and $NO_x$ removal.

The lead responsibility for developing those breakthroughs must lie with the Department of Energy. The control technology, coal preparation, and combustion systems programs in the Office of Fossil Energy Research and Development are sound, modest,

and worthy of continuation. I suggest rather than gut these programs as would the FY 1983 request by the Administration, that FY 1983 appropriations be frozen at the FY 1982 level. This would amount to a 30% reduction from FY 1981 levels.

This action would free EPA to pursue research needed to fulfill the obligations of statutes such as the Clean Air Act. While it is clear, responsibilities lie with EPA for monitoring, information transfer and health research, it is not clear where their responsibility lies in control technology development. Should EPA be funding development of LIMB, which is aimed at controlling sulfur dioxide and $NO_x$ in a combustion stage or should they work on matters such as fine particulate control? It depends upon the assumption we make. If we assume the EPA is in the business of funding development of control technologies designed for ever stricter emission limits, then one could argue they should be working on LIMB for the reasons of tighter $NO_x$ controls. On the other hand, the responsibility would be better handled by DOE, because they are in a position to decide whether LIMB will be more effective than say combined post-combustion control or catalytic conversion. To get around conflict of judgement, EPA and DOE have collaborated in interagency programming and decision-making.

For reasons of efficient utilization of resources, Congress must decide that EPA limit itself exclusively to the development of technologies in support of new source performance standards called for by a statute. DOE, on the other hand, should be working to develop technologies that would allow us to burn coal cleanly and effectively as part of a national

program of energy independence through coal dependence.

The Department of Energy's justification for Federal support of advanced coal utilization R&D has been well founded. Their program will provide more cost-effective and environmentally acceptable means for coal usage from new boiler capacity that will be built by the end of this century. Currently, there exists about 95,000 MW of utility oil-fired capacity, 30,000 MW which involve coal designed boilers that are now being fired with oil and 60,000 MW which were designed specifically for and are now being fired with oil The combined daily oil consumption for this capacity is currently about 1.2 million barrels per day. In the industrial sector, about the same amount, slightly over 1.3 million bbls/day of oil are now consumed in boilers to raise steam, and in furnaces to supply process heat.

As far as new coal-fired capacity, it now costs around 200 to 400 percent more to build a coal-fired plant than an oil-fired unit. About 25 percent of this cost differential is tied up in coal handling and storage and an addition 25% in environmental control equipment. The remainder is due to the larger and more complex boilers required for coal along with the additional ancillary equipment. So with current coal utilization technology, the utilities alone, for example, will have to pay about a $28 billion premium to burn coal in the new 92,000 MW of capacity they project for the 1990 to 2000 timeperiod.

The availability of new technologies such as the methods to clean coal to quality levels comparable to fuel oil and

techniques for producing and burning alternate coal fuel forms such as slurries or coal-water, coal-oil and coal-alcohol mixtures could have a major impact on this cost by eliminating coal handling and storage requirements and substantially reducing the environmental portion of these costs to levels associated with oil firing. In addition to these advanced coal preparation techniques, new power systems such as coal combustion combined cycles involving pressurized-fluidized bed combustors with gas turbines, or coal gasification combined cycle systems utilizing turbines or fuel cells can be of particular importance to the new utility capacity projected for construction during the last decade of this century. Moreover by developing these more cost effective and environmentally superior technologies to enable the utilities to expand the use of coal, some of these same technologies can also make the use of coal more attractive in smaller size boilers and furnaces and significantly enhance the increased industrial use of coal. With a reasonable level of economic recovery in this country, over 100 Quads coal usage, or the demand for over four billion tons can be expected to develop in the industrial sector over this same ten year period. These advanced technologies can help U.S. industry in this major shift in fuel as well as the utilities by providing a more cost effective and environmentally acceptable means of using coal.

So it appears that the original justifications for DOE's Fossil Energy coal utilization program were quite valid, and remain so today. It is particularly tragic that the FY 1983

budget request of just over $100 million for all of our national Fossil Energy R&D activities relegates coal utilization research to almost a meaningless level. About $25 million are requested for utilization compared to the $138 million appropriated by this Congress in FY 1982. The reason this is tragic is that there appears to now be a national need materializing for these utilization technologies which could be of even greater importance to this country than the importance we have previously associated only with our domestic energy problems.

That importance is centered in the major coal export market that this Administration supports and the substantial economic effect that it can have on our balance of trade through the rest of this century. The market is the developing world demand for coal and the world need for technologies to more effectively use it.

It is projected that by 1995, the total free world market excluding the U.S.A. will increase its coal consumption by 670 million tons. At an approximate delivered price of $60/T (equivalent to about $2.5/million BTU), this increase represents an additional market of around $40 billion, with about 50% of that going to coal producers and the other 50% to distributors. If the U.S. retains a 60% share of this market, as we have in Europe, our coal producers and distributors could enjoy about $24 billion worth of new export business over these next 13 years solely for the export of the bulk coal alone.

U.S. development of new coal utilization technologies could add significantly to this volume of export business by also positioning the U.S. as the world's major supplier of coal utilization equipment in addition to coal itself. These

technologies might also prove to be instrumental in maintaining our export market as competition increases for indigenous supplies of U.S. low sulfur coal and we begin to move more and more of our lower quality coals from the midwest into this marketplace.

Coal combustion emissions ($NO_x$, $SO_x$, particualtes) are currently not regulated in most countries of the world as they are in North America. Part of this reason is that not much coal is currently used, and where it is, the needs are for the most part satisfied by low sulfur coal. With the levels of world increase we are projecting, it is safe to assume that significant amounts of U.S. high sulfur coal and lower rank lignitic and subbituminous coals will eventually be competing for a major portion of this global demand, and emissions in most of the countries using coal will rapidly become regulated.

What better products could this country offer as a stimulus to increased sales of all ranks of U.S. coal than a complete spectrum of new utilization technologies which would permit conformance to these emerging emission regulations at minimum cost and with minimal environmental intrusion. We have never, as a country, developed an export market that has been successful solely upon the value of a bulk natural resource for sale. Our successes are in aircraft, computers, oil exploration, and agriculture to mention a few. Here we supply the world's every facet of technology needed to maintain, operate, and even develop their own independent systems. We should do the same for coal.

Our coal export policy must recognize the total value of the U.S. supplying not only coal, but everything any country would ever need to effectively utilize it. As an example, high ash

coals from China, South America and other countries will eventually be competing in the market as their production base develops. If future world market decisions are to purchase these coals, mined at cheap labor costs and nearby to minimize transportation costs, the U.S. should be in a position to supply fluidized bed technology or advanced coal cleaning technology for their most cost effective use. Likewise, we in the U.S. as the dominate country in the world with regard to coal reserves and coal utilization know-how should commit ourselves to be the ones to sell all ranges of technology for upgrading coal quality, altering its solid condition to more acceptable fuel forms and providing the means to cleanly burn all grades of inferior coal directly in a cost effective and environmentally acceptable manner.

In the 1990's for instance, this country should be building coal-water mixture preparation facilities in the Soviet Union or other countries as International Harvester is now doing in the USSR for tractor production. The U.S. should not limit its sights for supplying this new world market to only the bulk commodity of coal itself.

Now, for this coal utlization technology to be developed to a sufficient state to be commercial by the 1990's will depend upon a continued R&D funding commitment by the Federal government over the next several years. Private industry, although relieved of many financial burdens by this Administration's actions and thus better able to fund this type of development, will not be able to take up the slack created by the major cutback in Fossil Energy funding and fully develop these technologies

on their own in time for this emerging 1990-2000 market. We fully agree with the R&D policy of limiting the Federal role to longer-range, high-risk activities. Also, with the knowledge that our competitors are not now receiving unfair advantages in the financing of demonstration activities by the Federal government, we feel very comfortable with all the financial risks that these demonstrations can involve.

However, that is exactly where our available research funds will be going over these next few years -- into the nearer term,final development and demonstration efforts. We must depend upon the Federal government to maintain a responsible level of funding for these longer range coal utilization activities if they are to ever materialize. When that technology base reaches a point where we in industry can with some confidence, fit it into our overall business plans for profitable final development and commercialization, you can be assured that no further Federal efforts will be needed. This type of Federal-private sector partnership can eventually work for this country as effectively as it has in Japan and Germany. We are now competing in the world market not only with industrial giants, but also with foreign industrial-governmental conglomerates.

Thank you for the opportunity to express these views, and I will be happy to answer any questions you might have.

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Mr. SCHEUER. Very good. Let us proceed with Dr. Rothermel. You can take 6 or 8 minutes to sum up your testimony and then we will have some questions for all of you.

## STATEMENT OF DR. TERRY W. ROTHERMEL, ARTHUR D. LITTLE, INC.

Dr. ROTHERMEL. My message should be short and sweet because it is a few steps of simple logic.

I work at Arthur D. Little, a management and consulting firm. My work has been primarily that of consulting with companies who have wanted to enter the environmental industry over the last 15 years, or companies like Mr. Anthony's who are already in the industry. This has qualified me for doing a couple of studies for EPA over the last 10 years on the economic impact of environmental regulations, the industry that provides environmental products and services.

The main focus of my remarks, based on the most recent of those studies for EPA in 1978, is upon the question of: Can we leave the task of R. & D. to private industry in this problem area? This industry has its own characteristics and is probably not in a very good position to supply the technological needs of our environmental effort.

First let me take you down the demand side of the equation. The fundamental question there is: Is there a need for new technology? There are people who would say that we have caught up with the problem, that we do not need any more controls, and that we do not need any more technologies for controlling the major pollutants.

Mean while there is the ecological fact that we have an unlimited environment in which our production and economy will grow over time. By my arithmetic that means that we are going to have to increase controls over time, even if we are only to maintain the present level of quality.

A second fact is that up until now we have just been catching up with the problem. Indeed, this has frustrated a lot of private industry interested in developing technology. The name of the regulatory game has been to use existing technologies to control pollution in ways that we did not in the past. That has not been a good opportunity for advanced technologies.

So, maybe the future is going to see the real marketplace for advanced technologies because they have not found their role so far.

A third consideration is the traditional argument that there is always a need for technology for the usual American ethic of trying to reduce costs. The pollution control part of production is an area where you want to reduce costs even more. On the other side of the equation, the supply side, we must ask where the technologies are going to come from in the future. My answer was developed 4 or 5 years ago. It was thus not made in the heat of battle of today's discussion, and I think it is still appropriate.

We will start with the industries that cause the pollution. It has already been stated by the chairman that their incentives are suspect; they are not likely to do research on things that are going to increase their production costs unless they are forced to; and they

are not likely to increase research and increase their production costs if their competitors are not required to do so.

The second candidate for new technological development in the private sector is the industry which provides environmental products and services. As a student of this industry, I would characterize it in the following ways.

The largest companies—like Research-Cottrell—are companies with less than $1 billion in sales; they are not the giants of American industry. They are fair-sized companies. I would call them mid-sized companies, but they do not have the resources of the titans that lead many of the industries of this economy: the chemical industry; the pharmaceutical industry; the energy industry.

Second, these environmental companies have been in business for some time. Their corporate life did not start with the environmental movement of the 1960's. They were already in business to serve the sewage treatment needs of the country and—what was then called—the dust-collection needs of the country. Those businesses were mature industries—in current jargon—and mature industries do not need research and development. So these companies, when the environmental movement was born, did not have strong research and development capabilities. Futher the environmental movement, with all of its glamor, produced a lot of growth but not many profits. Thus these companies have not been able to afford to add research and development to their portfolio of strengths.

Today we have an environmental industry that has already leveled off in terms of its growth. Surprisingly, we have an industry in which a lot of the leaders in the industry have pulled out. And none of the titans of American industry—the Fortune 500 kinds—are looking at this industry any further for diversification. They are paying attention to areas like energy, biotechnology, et cetera.

The third source of technological development has been the Federal Government. This is not the first year that the Federal Government's funding of research and development is scheduled to decline. That has been going on and yet there is a serious question, from my experience, about whether private sector research will or can be sufficient to meet the Nation's needs to improve its environmental control capabilities.

I thank you and like Toby, I will be willing to answer any questions.

[The prepared statement of Dr. Rothermel follows:]

Statement by

Dr. Terry W. Rothermel
Arthur D. Little, Inc.

to the

HEARINGS ON THE FY 1983 EPA R&D
PROGRAM AND BUDGET REQUEST

held by

THE SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURAL RESEARCH, AND ENVIRONMENT

of the

U. S. HOUSE COMMITTEE ON SCIENCE AND TECHNOLOGY
March 2, 1982

I am Terry Rothermel. For the past 15 years, I have been a member of the professional staff of Arthur D. Little, Inc., an international research, development, and management consulting firm. I am a chemical engineer and also hold advanced degrees in business management.

In the last ten years, I have directed two separate studies for EPA's Office of Economic Analysis relating to the industries supplying environmental products and services. The second of these studies, completed in 1978, resulted in some conclusions which are still relevant to your hearing today on EPA's R&D Program.

Is There a Need?

The fundamental question is whether we still need new environmental control technology. Three major facts argue that the need is there. First, the ecological fact is that we have a growing economy in a limited ecology. Thus, in order merely to maintain our current environmental quality, we would have to reduce the amount of pollutants per unit of production over time. That greater control will require more advanced control technology.

The second factor is the state of development of environmental regulation. We have done a commendable job of catching up with our problems in some major pollutant categories...in water pollution, in air pollution, and in solid wastes. But we are only beginning to address the hazardous waste problem. The number of landfill sites is dwindling. That means future solutions must be found for both solid waste and hazardous waste disposal. Problems relating to less common pollutants of a toxic or hazardous nature are only now being addressed under our air and water pollution statutes.

The third argument for the need for new technology is economic--the traditional American drive to reduce the costs associated with any industrial activity. New technology is needed to reduce the still growing expense of pollution control, to avoid the need for it in manufacturing processes, or to transform these costs into economic benefits.

I believe there still is a need for innovation in environmental control technology. But that is the optimistic or demand side of the equation. The supply side question--where the technology is going to come from--is decidedly pessimistic.

Where Will It Come From?

Let's begin with the industries, which are the sources of pollution. They do not have the right set of incentives to sponsor needed innovative research. Pollution control continues to be viewed as a cost and not a profit-generating activity. Generators of pollution also have seen situations in which technological innovation would seem to have backfired for their companies. Innovative (and expensive) technologies have often been developed for very acute environmental situations. These solutions to acute problems have often been racheted by regulators into general industry-wide requirements without adequate consideration of differing environmental need or economic feasibility. This acts as a disincentive to develop innovative solutions to special problems.

A second candidate for the development of new technology is the environmental control industry. On the whole, however, the leading participants in that industry are mid-sized companies without the financial resources of the multi-billion dollar corporations that lead other sectors

of our economy. The private sector in this marketplace is less capable of carrying the full research and development load than its counterpart in other national problem areas, such as energy. Furthermore, the traditional leaders of the environmental industry were in their respective businesses (e.g., sewage treatment and dust collection) long before the era of federal environmental legislation. Their's were mature businesses that did not require R&D investment. What's more, the profits of the environmental industry have been, to say the least, disappointing...so much so, that many of its early leaders have gone out of the industry.

The prospects for technology innovation from a third source--federally funded research--have been dwindling for several years. This has been taking place despite the facts that the private sector generators of pollution do not have the right motivation and the product-supplying companies have limited resources for the essential development.

The kind of profit motive which at present is marshalling private sector capital into the biomedical field is not operative in the environmental arena. Too many corporate development departments of the Fortune 500 corporations have long since learned that the environmental industry has generally been unprofitable--even to its leading participants. Interest in entering this field has all but vanished during the past decade.

There is a possibility that technology innovation may come from overseas. I think that trend has already begun and that our economy is losing its leadership in environmental technology.

In addition to characterizing the R&D situation in environmental technologies, our study also encompassed environmental industry views on the nature of needed EPA-funded research. There was consensus on two major areas: research on health effects, and for demonstration of major new control technologies. Most respondents felt that the development of hardware items should be left to the private sector.

In conclusion, I must voice my concern about the growing gap I see between the future demand for new control technology and the ability of our economy to supply that technology. While the private sector logically might replace federal research in many fields, there is serious question about whether private research will or can be sufficient to meet the nation's needs to improve its environmental control capabilities.

Mr. SCHEUER. Well, you have both been very thoughtful and articulate and I appreciate it very much. Dr. Rothermel, what is the state of the art in disposal technology for hazardous waste? What additional research and development technology or development is needed and what role should EPA assume in this effort?

Dr. ROTHERMEL. I think one has to split technology into two parts: One, the basic technology that is used, and then second, how you apply the technology. I think experts in technology, who know technology better than I do, would say that the technology options are there: Incineration, landfill practice, and possibly stabilization might be listed. But, I would say that the application of those technologies to the specific problem of hazardous wastes is embryonic; we are just learning.

Mr. SCHEUER. Again, I ask you what role the EPA should play in the development of hazardous waste disposal?

Dr. ROTHERMEL. I am sorry, I forgot the second part of your question.

I think the EPA's role should be one of funding the basic demonstration projects that can show the proper application of these existing technologies to the hazardous waste problem.

I think, once again, we have the very special problems of hazardous waste to consider and the fact that we have had a number of hazardous waste firms going out of business. Unfortunately, the reputations of the hazardous waste companies generally, are not as good as the ones of water or waste-water treatment and air pollution control, before them. So there is more reason for the Federal Government to be involved in these initial projects.

Mr. SCHEUER. Now, on pollution control technology, what would you say that EPA's role ought to be in terms of stimulating development in the use of more efficient and more effective pollution control?

Dr. ROTHERMEL. I think that the results of my work a few years ago—and I do not think the situation has probably changed—is that EPA's role should be at the basic technology step of developing new mechanisms and new approaches. They should then skip the step of hardware development—which I think the environmental industry can handle—and go on to the support of major demonstration projects like energy recovery, coal-related pollution control technologies, etc., where the moneys required are quite large.

Mr. SCHEUER. Mr. Anthony, you exhibited great skepticism in your testimony and in your informal remarks as to whether the private sector really had intrinsically any incentive to invest in pollution control of all kinds. You said that they looked upon it as a cost of doing business and that there were going to have to be real incentives to get them into the act.

Let me ask you, if interest rates went down and if regulations became more stable and more business like, and more cost-effective, would that have a significant impact in inducing the private sector to invest in pollution control technology? Or is it intrinsically not an attractive investment which they would never make under any circumstances, no matter how good interest rates were or prudent and cost-effective the regulatory system became?

Mr. ANTHONY. You have to add one more ingredient, and that is some more predictability with regard to the emission limits.

Mr. SCHEUER. You mean in how long a given level of emission limits would span, would be effective so that there would be a market, let us say, for a 10-year period?

Mr. ANTHONY. Right. I testified before Senator Stafford's committee and I said that now we are reducing macroparticulates by 99.5 percent and reducing sulphur dioxide by 90 percent and we have not found any new threats connected with those 2 criteria of pollutants since 1970, why not freeze those standards for 10 years. If you did that, there would be enough incentive in the marketplace for the private sector to invest.

Now, that assumes, too, some moderation in the interest rate because, after all, payback period and interest rate are directly related. We have never had a period since World War II where interest rates have gone down below a certain base level. But, let us say that they did go down to 8 or 10 percent and we are talking about a payback period of about 7 years, that is still a long time, but it would be awfully tantalizing for the private sector if there was predictability in those standards—it would be very tempting.

The other part of this story is—and we cannot ignore this—is that the first job we did was to stop pollution at the end where it was visible, where it was coming out of the stack—what you might call Band-Aid type management. But, the preemptive end is where, very likely, the most cost-effective systems will be. As we are removing the ash and removing the sulfur dioxide—incidentally you can remove heavy metals by rotation in a coal washing process—and then get that superclean coal, which is right near the mine and, I do not know what you do with that waste, but you leave it at the mine. Then, I think you are going to have the most cost-effective source of fuel and the most environmentally sound.

Mr. SCHEUER. You state in your testimony that EPA should exclusively develop technologies in support of new source performance standards that are called for by the Clean Air Act. What does such technology entail and what would be the best way for EPA to stimulate its development?

Mr. ANTHONY. Well, they have been required to come out with standards for fine particulates and, I believe, this schedule calls for heavy mills, too. Do you know, Terry? I think so. That should be the exclusive responsibility of the EPA because it has to do with health and safety effects. It should not be the responsibility of the Department of Energy, for example, to invest in that kind of control technology. Because when EPA invests in that kind of technology, and they do not do the work themselves, they contract out with private firms, research houses, companies like mine—when they do that then they can write a standard because then they have a definition of best available control technology and that is the driving force behind their type of work. They should not be doing work on limestone injection, multiple burner technology which is a clean combustion technology to remove sulfur dioxide—that should be the Department of Energy's job and if that is not a competitive technology with pressurized fluidized bed or superclean coal, then the Department of Energy should have the job of saying that we will drop this one and concentrate on this one.

The EPA does not have a spectrum of technologies that they are interested in, in that regard. They should be sticking with new source performance standard support.

Mr. SCHEUER. They should be sticking with what?

Mr. ANTHONY. Supporting technology development with relationship to new source performance standards.

Mr. SCHEUER. Yes. Well, it has been a very interesting hearing and you have been very patient and long-suffering. It is now well after 5 p.m. I want to thank you both for your splendid testimony; your very thoughtful and responsive testimony and we will be providing you with some additional written questions that we hope you will answer for the record as promptly as you should.

Thanks to you both.

I declare this hearing to be adjourned.

[Whereupon the subcommittee was recessed at 5:10 p.m. subject to the call of the Chair.]

# FISCAL YEARS 1983 AND 1984 ENVIRONMENTAL PROTECTION AGENCY RESEARCH AND DEVELOPMENT AUTHORIZATION

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FRIDAY, MARCH 19, 1982

HOUSE OF REPRESENTATIVES,
COMMITTEE ON SCIENCE AND TECHNOLOGY,
SUBCOMMITTEE ON NATURAL RESOURCES,
AGRICULTURE RESEARCH AND ENVIRONMENT,
*Washington, D.C.*

The subcommittee met, pursuant to call, at 9 a.m., in room 2318, Rayburn House Office Building, Hon. James H. Scheuer (chairman of the subcommittee) presiding.

Mr. SCHEUER. The Subcommittee on Natural Resources, Agriculture Research and Environment, will conclude its 1983 hearings on the EPA research budget.

We are very pleased to have with us this morning the Administrator of the EPA, Ms. Anne Gorsuch, who will present and defend her budget.

It is hard for me to overemphasize the importance of this R. & D. budget because it has had a great deal of controversy and it goes to the very heart and essence of the EPA function.

Ms. Gorsuch, when you last appeared here on October 22, we communicated our concerns to you about the EPA budget. I must say that as we have received more and more specific data about your request, our concerns have deepened, rather than having been assuaged.

The environmental statutes, of course, and the business communities, to the extent that there is support of our statutes concerning the environment, are all based on the fact that we will have standards and regulations and a regulatory posture that is backed up and supported by hard, scientific, and technological information.

This budget you have presented to us represents a 37-percent reduction from your 1981 funding, and in the case of energy R. & D., a two-thirds reduction from $100 million to $34.5 million. Therefore, it goes to the heart of the credibility of EPA's regulatory posture.

I think that there is a consensus here that you would really have to present an extraordinarily convincing argument to maintain EPA's credibility, to provide an adequate factual base, to support an effective and a cost-effective regulatory posture in the face of these very deep budget slashes.

This will be a formidable task, and I hope that our discussions today, your testimony and our questions, will lead to a constructive resolution of our concerns.

Before I call on the other Members to make remarks and before your testimony, due to the urgent travel necessities of our colleague from Rhode Island—she must leave here in another 10 or 15 minutes to catch a plane—I am going to call on Congressperson Claudine Schneider for some remarks, and perhaps some questions.

Mrs. SCHNEIDER. Thank you very much, Mr. Chairman. I appreciate your indulgence, and those of my colleagues and the witnesses, in allowing me to ask questions before your testimony, but I do have to run to catch an airplane.

Ms. Gorsuch, EPA has claimed that they are not cutting into your various research needs and that you will be focusing the agency's dollars in a more efficient way to be spent for research. You have said that many of the research programs are short term and, therefore, it is possible for them to be terminated because they are nearing completion.

Many of my questions today will, I think, point out that the budget cuts are cutting into real research needs and that this is not necessarily a result of efficiencies or movement toward efficiencies.

About 6 months ago, when you were last here, you testified that EPA's indoor air research program—I would like to quote from your testimony at that time—

> With regard to specific projects, ORD also evaluated asbestos removal methods and evaluated effectiveness and costs of hydro air filters and carbon monoxide removal in residences and study sources and levels of indoor nitrogen oxide, carbon monoxide and formaldehyde.

Are you aware that funds for these removal studies were rescinded at your request in the fiscal year 1981 budget?

Ms. GORSUCH. I would like to refer your question to Dr. Riordan on the specifics of the numbers. He may need some assistance from our budget officer in that regard.

Dr. RIORDAN. With regard to the rescission, I was not aware of that specifically. I know we put money in the 1982 program on the order of $500,000 in the indoor air research program. It is broken up between the control technology program and the monitoring program.

Approximately $350,000 is devoted to characterization of indoor air. The remaining money is looking at, I believe, the radon and formaldehyde.

I would like to refer to Dr. Wiser who will be able to provide you with the detail.

Ms. GORSUCH. This is Dr. Herbert Wiser from the Office of Research and Development.

Dr. WISER. In the control technology area, approximately $150,000, is funding a study of heat exchangers for indoor air, which will look at the items involved, such as formaldehyde or radon.

We are continuing to complete those studies. As Dr. Riordan said, the $350,000 in our monitoring area is to characterize the indoor pollution problem, to determine exactly what is there. Then that can be used as a basis for further research, if necessary.

Mrs. SCHNEIDER. So in essence there are three expenditures for moneys to characterize the problem for control technology and then for ongoing monitoring. Is that right?

Mr. WISER. The ongoing monitoring is part of the characterization, which data will be used for total human exposure assessments.

Mrs. SCHNEIDER. Have you budgeted any specific funds for projects in the fiscal year 1982?

Dr. RIORDAN. Those projects are in the 1982 budget.

Mrs. SCHNEIDER. What happened to the monies that were rescinded that you requested in fiscal year 1981?

Dr. RIORDAN. The moneys from the proceeds on this are being used to fund the fiscal year 1982 program.

Ms. GORSUCH. I should point out that the rescission which was requested was not effected by Congress and so did not ever go through, Congresswoman.

Mrs. SCHNEIDER. In your testimony last year, you said—and I also quote this—

"In fiscal year 1982 we plan to investigate radon removal devices, such as air-to-air heat exchanges, recirculating filters and electrostatic precipitators, as well as other radon control methods, preconstruction site selection and drinking water supplies."

You had indicated that you are going to be doing that in the 1982 budget. Are there plans for the 1983 budget that complement this?

Dr. RIORDAN. In fiscal year 1983 there are no funds devoted to indoor air. The reason is that the control technology program is funded sufficiently to provide us with reports to the agency in terms of what might possibly be done in the future.

In terms of the characterization, our position has been that the indoor problem has not been an EPA major responsibility. The program office has not, with its priorities, identified indoor air in its interpretation of the mandates of Congress as an area in which they would like anything other than what I would call problem exploration data. We are providing that as the basis of carrying on our characterization studies.

Mrs. SCHNEIDER. You mentioned indoor air is not necessarily one of the top priorities. But as a means of background I would like to point out the issue and problem with urea formaldehyde foam insulation, which is now going to be banned by the Consumer Product Safety Commission. It has been proven a health hazard.

What is interesting to note is that Canada has already banned it. Not only is it going to be a health hazard, but also an economic disaster for many people.

I think that this is a situation that we very clearly could have prevented if we had more information about formaldehyde to begin with and we could have saved a lot of people a great deal of money and risk to their health.

Since EPA is downgrading its research on formaldehyde intentionally, it has essentially eliminated that, I guess, from your indoor air pollution research program.

Ms. GORSUCH. There are two things here: One, indoor air pollution; another, our research on formaldehyde.

In terms of indoor air pollution, you are quite right, that is a matter of concern. Clearly it is not a primary EPA concern. Our

jurisdiction, according to the Clean Air Act, is based on the outdoor or ambient air quality standards where we have a direct role.

Clearly other agencies, such as OSHA and the Consumer Product Safety Commission, have responsibilities for regulating the indoor or workplace atmosphere, or consumer products.

Mrs. SCHNEIDER. What I am talking about is not necessarily the workplace. I am talking about homes. If there is no specific jurisdiction for indoor air pollution as it relates to places such as this or individual residences——

Ms. GORSUCH. Indeed. As I said, there are overlapping jurisdictions: OSHA, with the workplace; the Consumer Product Safety Commission with consumer products, whether in the home or elsewhere, as it recently regulated the formaldehyde question.

Where does EPA's role come in? In terms of our work on formaldehyde, it is not terminated, it is ongoing. Our concern comes from our authority under TSCA, and I would like Dr. Hernandez to elaborate on that.

Dr. HERNANDEZ. We have proposed a rigorous program of continuing to evaluate the formaldehyde information. We have taken this question to EPA's Science Advisory Board. At our April meeting, we are going to make a proposal for an NAS review of the existing information as it continues to come into place.

There is a major study underway right now with 16,000 people who have worked in the formaldehyde industry or associated industries, to evaluate the health risks that they have suffered.

As this information becomes available, it will give us guidance as to what the importance of ambient exposures are in different settings. We are going on with that evaluation.

Mrs. SCHNEIDER. OK. So back to the formaldehyde and the problems that it has caused.

As you are probably aware, there has been a Government study that involved DOE, OSHA, NIOSH, FDA, NIH, and National Cancer Institute, which had some work or assistance by the industry, by the Chemical Institute of Toxicology.

Their conclusion was very straightforward and very clear that formaldehyde represented a carcinogenic risk to humans.

Dr. HERNANDEZ. They said it would be prudent to presume it was a human carcinogen. Those were their words.

Mrs. SCHNEIDER. Do you agree with that, that it is prudent to assume that it does represent a carcinogenic risk?

Dr. HERNANDEZ. Certainly at some levels that people may be exposed to it. I think there is some indication that there is a threshold level for this finding. This is one of the things that we hope will come through in these very, very large epidemiological studies.

Mrs. SCHNEIDER. I would also like to point out that in the National Academy of Sciences report, which I hope you are familiar with, talks about indoor air pollution and formaldehyde research, and also talks about potential health problems associated with formaldehyde exposures.

They say health problems are readily identified in acute cases when concentrations are high and tolerance is low. The committee is concerned with long-term, essentially continuous indoor exposure to low concentrations of formaldehyde.

I guess my bottom line question is how is it that we are going to be able to have some confidence in your research program when you are assigning formaldehyde relatively low priority?

Dr. HERNANDEZ. I don't think that is the case. It depends on where it appears in EPA's budget. The Office of Toxic Substances is where that formaldehyde study is going on as an operational program, not as a research program.

We are working with other Federal agencies. We have an interagency group that is looking into this and also working with industry in terms of these reports.

As a followup to that NAS study, we have a proposal from them to review this data as it becomes available. That is the one we are taking to the Science Advisory Board in April for their concurrence.

Mrs. SCHNEIDER. So you do assume that you will have a final decision by April?

Dr. HERNANDEZ. No, no.

Mrs. SCHNEIDER. You will just take their review at that time?

Dr. HERNANDEZ. We will ask, Should we have NAS continue this study? This would be a second round of the one that you have in your hand, a second phase of formaldehyde studies based on new data that is continuing to be developed; that is, the 16,000-person cohort.

In addition, there are about eight or nine other major studies that have been culminating and coming into print. We anticipate significant new information will be available in the coming year. NAS has proposed about an 18-month review as that information becomes available.

Mrs. SCHNEIDER. I am concerned with the time element. Would you characterize this as being fast-track review?

Dr. HERNANDEZ. I think it depends upon our responsibility vis-a-vis that of other Federal agencies. There is nothing available at this time to indicate that there is an ambient concern to the ambient population as a result of formaldehyde exposures.

Mrs. SCHNEIDER. It seems to me that certainly the insulation problem is enough of a concern. In Canada they are already determining setting up special funds to determine how they are going to reimburse people whose residences are now——

Dr. HERNANDEZ. I think that is a CPSC [Consumer Product Safety Commission] question that has been addressed.

Mrs. SCHNEIDER. I would like to move on to some water quality standard questions.

Are you going to be basing your water quality standards on the water quality criteria for pollutants your Agency is developing?

Dr. HERNANDEZ. The States are the ones who set those standards, not EPA. The water quality criteria that we have established are based on laboratory-derived studies of a number of species within each of a number of categories and groups; that is, some of them are algae, some are plants, some are other forms of life.

We are working with the States on a pilot program right now to transform these laboratory-derived criteria into in situ, on site, criteria that can be used for specific biolife at a particular place.

Mrs. SCHNEIDER. How many criteria have you already developed?

Dr. HERNANDEZ. Sixty-five. The R. & D. work has been done for all 65.

Mrs. SCHNEIDER. How many are you studying right now?

Dr. HERNANDEZ. That is the total that was mentioned in the 1977——

Mrs. SCHNEIDER. The total is 65?

Dr. HERNANDEZ. Yes.

Mrs. SCHNEIDER. How much have you cut the research budget for water quality?

Dr. HERNANDEZ. We can include that for the record, but there are some things that we have terminated because they have been accomplished.

Mrs. SCHNEIDER. Well, I have a few other questions that I am afraid I will have to leave for purposes of the record, Mr. Chairman, if we might be able to include those in the record at a later time.

I thank you very much.

Mr. SCHEUER. You are making unanimous consent request that the record be kept open for additional questions and the answers of the Agency. Without objection, so ordered.

[The information follows:]

The major changes which resulted in the proposed fiscal year 1983 water quality research of $8.1 million were:

(1) completion of the Great Lakes Program (−$2.5 million).

(2) reductions in health research as a result of completion of the criteria documents for the 65 priority pollutants (−$1.3 million).

(3) reductions in environmental processes and effects research resulting from completion of criteria documents for the priority pollutants and shift to site specific problems to be addressed at the State and local level (−$2.4 million).

(4) reductions in monitoring as a result of State assumption of many of the monitoring and quality assurance responsibilities (EPA will continue in-house effort on methods development, quality assurance and transfer of methods to States.) (−$1.3 million).

(5) reduction in risk assessment support as a result of completion of the criteria documents (−$.7 million).

An increase of $0.1 million is included to support increased dissemination of technical information to Regional Offices and States.

Mrs. SCHNEIDER. Thank you for your time and responses.

Mr. SCHEUER. I thank you for your patience and indulgence and will now resume the regular order.

I will be happy to yield to the distinguished ranking minority member, Mr. Carney of New York.

Mr. CARNEY. I thank the panel for their indulgence, going out of order, but as you know, Members of Congress are doing a lot of traveling, and we are required to be all over at one time. We appreciate your thoughtfulness.

Today represents a crucial part of the Government process. The Constitution has created legislative and executive branches of Government as separate but equal. It is this system of checks and balances that keeps the genius of the American Government in operation.

President Reagan feels he was given a mandate 1 year ago in November to make certain changes—changes which were much needed and long overdue. The way out of inflation is through economic discipline, not by continued spending.

Each Member of this Congress has also been given a mandate from the people he or she represents to take equal part in the shaping of policies of our Government.

The fulfillment of these responsibilities, our job here today, is to examine the proposed 1983 Presidential budget request for EPA research and development programs, and to determine its adequacy and appropriateness in addressing the critical environmental questions facing us today.

As our distinguished chairman stated, the Members of Congress are deeply concerned over the EPA research program. The Environmental Protection Agency has enjoyed bipartisan support in the Congress since its inception under a Republican administration. That same bipartisan support exists in this Congress today, as does the concern over the future of the Agency.

In fiscal year 1983, congressional budget requests of EPA indicate that the media cuts are in response to completion of several research efforts, as well as the efficiencies in scheduling research and the reductions in areas that were cost effective.

This subcommittee has requested the presence of the Administrator of the EPA, Ms. Gorsuch, to substantiate the justifications of these cuts and to indicate how this budget reflects the Agency's responsibility in protecting the health of the people and the integrity of the Government.

I join the chairman in welcoming you today, Madam Administrator, and I also welcome Dr. Hernandez, Deputy Administrator, and Dr. Courtney Riordan, Acting Assistant Administrator for R. & D.

I think rather than to prolong this I will yield back my time to the Chair and look forward to listening to our distinguished witnesses.

Mr. SCHEUER. Thank you very much, Mr. Carney.

Congressman Brown?

Mr. BROWN. I ask unanimous consent to provide my remarks for the record.

Mr. SCHEUER. Very good.

We are very happy to hear you, Ms. Gorsuch. Your full statement as it has been prepared for us will be printed in its entirety in the record.

Now we have four Congressmen here—the three of us and Congressman Gore of Tennessee, who will be back. We are going to give each one of them a chance to question you for 15 minutes, which will be 1 hour. If any other Congressman shows up we will give him or her 5 to 10 minutes.

We know the time constraints under which you function and we are cognizant of the fact that you have a very busy schedule. We are very appreciative of your courtesy in coming here today.

You may sum up your testimony and refer to anything you have heard this morning. Then we will take approximately 1 hour for all of the members in questioning you. Then we will be happy to release you for other very important functions.

At this time please proceed as you wish, for as long as you wish. Then we will question you for approximately 1 hour.

**STATEMENT OF ANNE M. GORSUCH, ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY, ACCOMPANIED BY JOHN W. HERNANDEZ, DEPUTY ADMINISTRATOR; AND COURTNEY RIORDAN, ACTING ASSISTANT ADMINISTRATOR; FOR RESEARCH AND DEVELOPMENT**

Ms. GORSUCH. Thank you.

I will attempt to make my remarks very short if I can. Obviously it is a complicated area in which describing each part in detail will probably be left to question and answers.

I would like to introduce Dr. John Hernandez, who is here at the table with me, our Deputy Administrator, and Dr. Courtney Riordan, our Acting Administrator for Research and Development.

Before describing our fiscal year 1983 research activity I would like briefly to discuss our budget perspectives and the overall role of ORD in each of its major offices. Then I will highlight the major changes proposed for fiscal year 1983.

Finally, I will address the other issues raised in your letter of invitation.

The research budget is the product of intense analysis and detailed review of the research requirements facing the Agency and its programs. This analysis has led to the development of a spending program designed for effectiveness and efficiency in fulfilling our statutory responsibilities, both in the near- and long-term sense.

Although the numbers reflected in this budget are important, more important than the numbers is the reality they represent. Government spending should not be automatically increased each year.

Responsible environmental leadership and good governmental management demand that we painstakingly review where we have been and where we are going in terms of environmental protection.

Then again, we must begin the process of identifying the research needed to get there. It is all too easy to say, "Spend more money each year," but to justify ever-increasing spending in light of our real needs is quite difficult.

Some equations do not add up. More dollars in the EPA R. & D. budget do not equate directly to more useful products, to better research results, to more productive EPA scientists, to more effective environmental regulations, or even to a safer environment for Americans—our ultimate goal.

The vast majority of environmental legislation is not new. Nearly all of the statutory changes resulting in significant resource requirements occurred more than 5 years ago. TSCA and RCRA were enacted in 1976, for example, and the latest Clean Air Act Amendments in 1977. Only Superfund is relatively new, and large investments in these areas have already been made.

To believe that each and every research program requires the same or greater investment each and every year, regardless of the work already done, is a poor assumption and one that could lead to research which is neither cost effective nor a good use of taxpayer dollars.

Obviously in any successful regulatory program the heaviest expenditures should come first, as we develop the necessary research on which regulations, guidelines, and expertise must be based.

In this respect, as the subcommittee has emphasized, early and thorough research is indeed one of the basic foundations upon which successful implementation rests. But the goal is implementation, not merely research for the sake of research, and once the necessary knowledge is acquired it does not have to be continually refunded and reacquired at the same levels each year.

The role of EPA's research and development program in this administration continues as the source of scientific expertise in the Agency supporting the regulatory programs. Approximately 80 percent of ORD's total budget supports relatively short-term research on problems of immediate regulatory concern to the Agency's regulatory process; the remaining 20 percent funds longer term research on more fundamental, or exploratory, scientific issues.

Such longer term research is aimed at anticipating future environmental problems and examining new approaches to environmental management.

In order to carry out its mission, the Office of Research and Development is organized along discipline lines into six major offices: the Office of Health Research, the Office of Environmental Processes and Effects Research, the Office of Environmental Engineering and Technology, the Office of Monitoring Systems and Quality Assurance, the Office of Health and Environmental Assessment, and the Office of Exploratory Research.

Our research efforts have been and will continue as a mix of long term and more immediate investigations and applications. In total, however, the resource levels for research represent a reduction from $278 million to $216 million, or a 22-percent decrease with a support level of 1,303 permanent work years, 251 fewer than last year.

This change reflects the completion of efforts in many areas which will enable us to reduce our overall research component, as well as invest in newer areas.

For example, the agency has completed ongoing work where sufficient information now adequately supports the decisions facing us. Examples are the completion of research for the effluent guideline program, which Dr. Hernandez mentioned; the phasing down of work on diesel particulates; the completion of initial superfund research; and the conclusion of much of the research support for the toxic substances initial test guideline program.

In several areas, we have invested in research to a point where the additional investment could be wasted or where we now feel we are ahead of an industry's development. We have made enormous investments over the years in control technologies for a variety of potential pollution sources. This is true both in the air and water pollution areas. There are increasing off-the-shelf technologies available for use. In the synthetic fuel area, we now believe our efforts in evaluating the performance and reliability of control technologies are in advance of the industry's overall development, and before we continue to invest further, we need to have commercial facilities available for examination. We see no need for the continuation of heavy investments in 1983.

With the exception of our long-term research component, in the year ahead we plan to focus our research effort, primarily on support of regulatory outputs required by the individual program offices. We are concentrating on four areas.

Through the allocation of resources and improved management we will focus on improving the scientific basis of our regulatory actions. For instance, we are maintaining at basically the same level our efforts in hazardous waste research to provide a firm scientific basis for future RCRA regulations.

We are increasing risk assessment work by $2 million to provide uniform guidelines in performing such assessments. We are also requesting $10 million to continue the development of our quality assurance programs across all media.

Research will be focused on providing the basic information for regulatory reform. Toxics research will emphasize the development of improved analytic tools to increase our efficiency and substantive review of chemicals.

Again we are increasing our efforts to improve benefit models to better assess our regulatory actions from a benefit as well as a cost basis.

We are insuring that our research base is adequate, particularly in areas of emerging concern. For example, in addition to our continuing efforts in hazardous waste, we are increasing our investment in acid rain research by 33 percent, from $9 million to $12 million. We are again increasing our research in support of the review of the ozone standard.

Finally, we are continuing our commitment to longer term research. We will continue to have direct relationships with the academic community in our grants program directed at specific research needs.

The new process for improving the scientific adequacy of EPA's regulations and standards requires that scientific data supporting selected significant regulatory actions be submitted to the SAB for review.

Under this process the Deputy Administrator will select 15 to 25 rule packages, based upon recommendations of the Science Adviser and the Director of Standards and Regulations, for SAB review each fiscal year.

The SAB will review both the scientific data and a comprehensive scientific issues paper which identifies all major scientific issues related to the proposal, significant areas of scientific uncertainty and key scientific studies, and its possible interpretations.

The SAB participation is concerned solely with the scientific basis of the proposal and will confer no authority to approve or disapprove the action. Its review is to be completed within 90 days after submittal of the material.

The work group which developed the package will then make appropriate modifications before submitting the proposed regulations to the Steering Committee. The SAB comments will accompany the package through all subsequent reviews until final promulgation of the proposal.

The benefits to EPA of this SAB review process include explicit and early review of scientific data supporting rulemaking action, an independent source of advice for the Administrator prior to pub-

lication of a proposal; and increased public acceptance of EPA's regulatory decisions.

The Science Advisory Board has been restructured and now consists of five committees: the Executive Committee, the Environmental Health Committee, the Environmental Effects, Transport and Fate Committee, the Environmental Engineering Committee, and the Clean Air Scientific Advisory Committee, which is chartered separately.

In selecting our new SAB members, nominations are received from present SAB members and a number of individuals and groups from outside EPA. They are chosen for their expertise in scientific disciplines needed for the SAB scientific review and to give representation to various schools of scientific and engineering thought. I have appointed new members from this list of nominees to terms ranging from 1 to 4 years.

As the subcommittee is aware, we have been examining better ways of organizing, planning and managing the EPA research effort.

The first phase involved a detailed look at R. & D. Headquarters' mission and organization. That work is now nearly completed, and we are in the second phase, addressing our field laboratory structure.

We are focusing on the relationships between Headquarters and the field and on the relationship between the laboratories in each major scientific area.

The group addressing Headquarters has largely completed its work. The laboratory task force will be working through March and should have final proposals ready early in April.

Based on what I have seen to date, I am quite enthusiastic. I believe that our staff has managed to retain the best elements of the current planning and management systems and combined them with a new organizational structure which will stress accountability, facilitate clear and more direct communication between Office of Research and Development and the regulatory programs and, most significantly, establish Headquarters as the focal point for developing strategic plans and policy guidance and make our senior laboratory officials responsible for day-to-day research implementation and management.

I anticipate that all of our proposals will be completed before summer, and I look forward to sharing the details with you as soon as possible.

In conclusion, Mr. Chairman, I feel our research budget is both realistic and environmentally sound. Our proposal focuses on fulfilling our statutory mandates for environmental protection while complying with the President's effort to reduce Federal spending.

All rhetoric to the contrary, better and more pertinent research and fiscal responsibility are not mutually exclusive, and in our efforts in the year ahead we intend to insure that both go hand in hand.

As we have testified time and time again, this administration's agenda is not secret, but clear and overt: a strong Environmental Protection Agency to meet the environmental protection goals of the Nation.

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That strong EPA depends upon what we do with our research programs, and that is why we intend to concentrate our efforts on better quality research, on focused research, and upon improved science behind our programs.

We have good people and a good program, and I am proud of both.

Thank you, Mr. Chairman.

[The prepared statement of Ms. Gorsuch follows:]

STATEMENT OF
ANNE M. GORSUCH
ADMINISTRATOR
U.S. ENVIRONMENTAL PROTECTION AGENCY
BEFORE THE
SUBCOMMITTEE ON NATURAL RESOURCES, AGRICULTURE RESEARCH
AND ENVIRONMENT
COMMITTEE ON SCIENCE AND TECHNOLOGY
HOUSE OF REPRESENTATIVES

MARCH 19, 1982

Good morning, Mr. Chairman and members of the Subcommittee. I am happy to meet with you to present the fiscal year 1983 research and development program of the Environmental Protection Agency (EPA). Accompanying me are Dr. John Hernandez, the Deputy Administrator, and Dr. Courtney Riordan, Acting Assistant Administrator for Research and Development.

Before describing EPA's fiscal 1983 research activities, I will briefly discuss our budget perspectives, and the overall role of ORD and each of its major offices. Then I will highlight the major changes proposed for Fiscal Year 1983. Finally, I will address the other issues raised in your letter of invitation.

Budget Perspectives

The ORD budget is the product of intense analysis and detailed review of the research requirements facing the Agency and its programs. This analysis has led to the development of a spending program designed for effectiveness and efficiency in fulfilling our statutory responsibilities, both in the near and long-term sense.

Although the numbers reflected in this budget are important, more important than the numbers is the reality they represent. Government spending should not be automatically increased each year. Responsible environmental leadership and good governmental management demand that we painstakingly review where we have been and where we are going in terms of environmental protection. Then we must begin the process of identifying the research needed to get there. It is all too easy to say, "Spend more money each year." But to justify ever-increasing spending in light of our real needs is quite hard. Some equations do not add up -- more dollars in the EPA R&D budget do not equate directly to more useful products, to better research results, to more productive EPA scientists, to more effective environmental regulations, or even to a safer environment for Americans.

The vast majority of environmental legislation is not new. Nearly all of the statutory changes resulting in significant resource requirements occurred more than five years ago. TSCA and RCRA were enacted in 1976, for example, and the latest Clean Air Act Amendments in 1977. Only superfund is relatively new, and large investments in these areas have already been made. To believe that every research program requires the same or greater investment every year, regardless of the research already done, is a poor assumption, and one that could lead to research which is neither cost-effective nor a good use of taxpayer dollars.

Obviously, in any successful regulatory program, the heaviest expenditures should come first, as we develop the necessary research, regulations, guidelines, and expertise. In this respect, as the Subcommittee has emphasized, early and thorough research is indeed one of the basic foundations upon which successful implementation rests. But the goal is implementation, not just research for the sake of research, and once the necessary knowledge is acquired, it does not have to be continually refunded and re-acquired at the same levels every year.

Role of Research and Development

The role of EPA's research and development program in this Administration continues as the source of scientific expertise in the Agency supporting the regulatory programs. Approximately 80 percent of ORD's total budget supports relatively short-term research on problems of immediate concern to the Agency's regulatory process; the remaining 20 percent funds longer term research on more fundamental, or exploratory, scientific issues. Such longer term research is aimed at anticipating future environmental problems and examining new approaches to environmental management.

In order to carry out its mission, the Office of Research and Development (ORD) is organized along discipline lines, into six major offices -- the Office of Health Research, the Office of Environmental Processes and Effects Research, the

Office of Environmental Engineering & Technology, the Office of Monitoring Systems and Quality Assurance, the Office of Health and Environmental Assessment, and the Office of Exploratory Research.

The Office of Health Research conducts three principal types of research: (1) animal and human studies to determine the possible adverse human health effects of pollutants at various environmental exposure levels; (2) development of better test methods; and (3) development of ways to use animal and human data to predict human endangerment at environmental exposures more accurately.

The Office of Environmental Processes and Effects Research develops the scientific methods and technical data on entry, movement and fate of pollutants through the environment and the food chain and on the environmental effect of pollutants.

The Office of Environmental Engineering and Technology addresses four major types of activities: (1) assessing pollution from industrial and municipal processes; (2) generating technical information on the cost and performance of control measures; (3) characterizing the performance of generic pollution control technologies; and (4) fostering improved pollution control measures.

The Office of Monitoring Systems and Quality Assurance focuses on providing cost-effective measurement methods and monitoring systems, and developing quality assurance procedures and protocols to assure the generation of accurate environmental data.

The Office of Health and Environmental Assessment conducts assessments of the potential health hazards and the magnitude of the hazard associated with populations exposed to environmental contaminants.

The Office of Exploratory Research was established to improve ORD's overall capability to perform long-range research and analysis of emerging problems, and has two major functions: (1) managing the competitive research grants process and the research centers support program, and (2) performing strategic analyses of environmental trends and conducting special studies on the impacts of emerging technologies.

ORD Budget Breakdown

Our research efforts have been and will continue as a mix of long-term and more immediate investigations and applications. In total, however, the resource levels for research represent a reduction from $278 million to $216 million, or a 22 percent decrease, with a support level of 1,303 permanent workyears, 251 fewer than last year. This change reflects the completion of efforts which will enable us to reduce our overall research component, as well as invest in newer areas. For example:

- The Agency has completed ongoing work where sufficient information now adequately supports the decisions facing us. Examples are the completion of research for the effluent guideline program; the phasing down of work on diesel particulates; the completion of initial

superfund research; and the conclusion of much of the research support for the toxic substances initial test guideline program.

- In several areas, we have invested in research to a point where the additional investment could be wasted or where we now feel we are ahead of an industry's development. We have made enormous investments over the years in control technologies for a variety of potential pollution sources. This is true both in the air and water pollution areas. There are off-the-shelf technologies available for use. In the synthetic fuel area, we now believe our efforts in evaluating the performance and reliability of control technologies are in advance of the industry's overall development, and before we continue to invest further we need to have commercial facilities available for examination. We see no need for the continuation of heavy investments in 1983.

In the year ahead, we plan to focus our research effort, with the exception of our long-term research component, primarily on support of regulatory outputs required by the individual program offices. We are concentrating on four areas:

- Through the allocation of resources and improved management, we will focus on improving the scientific basis of our regulatory actions. For instance, we

are maintaining our efforts in hazardous waste research to provide a firm scientific basis for future RCRA regulations.

In our hazardous waste program, we are increasing risk assessment work by $2 million to provide uniform guidelines in performing such assessments. We are also requesting over $10 million to continue the development of our quality assurance programs across all media.

- Research will be more focused on providing the basic information for regulatory reform. Toxics research will emphasize the development of improved analytic tools to increase our efficiency and substantive review of chemicals. We are increasing our efforts to improve benefit models to better assess our regulatory actions from a benefit as well as a cost basis.
- We are ensuring that our research base is adequate, particularly in areas of emerging concern. For instance, in addition to our continuing efforts in hazardous waste, we are increasing our investment in acid rain research by 33%, from $9 million to $12 million. We are increasing our research in support of the review of the ozone standard.
- Finally, we are continuing our commitment to longer term research. We will continue to have direct relationships with the academic community in our grants program directed at specific research needs.

Air

Research into the problems associated with airborne pollutants has been reduced from $55,731,700 and 365 permanent workyears to $47,185,000 and 309 permanent workyears, a reduction of $8,546,700 and 56 permanent workyears. These redirections better focus the program on providing the information required for the mandatory periodic revisions of the national ambient air quality standards and refining air modeling and monitoring techniques.

Efforts to evaluate the risks to humans of exposure to air pollutants will be increasing. In the area of air pollutants, the research program will provide greater support to the Office of Air, Noise and Radiation (OANR), EPA's air regulatory arm, by identifying and ranking substances which warrant more in-depth regulatory analysis. We will also focus additional resources on completing the criteria documents which support the ambient standards for lead, oxidants, and carbon monoxide and more carefully phase our work to match legislated schedules.

Research on the human health effects of exposure to inhalable size particles in combination with other prevalent pollutants is being emphasized in 1983 to provide scientific support for revising the current total suspended particulate standard to one which recognizes the more injurious effects of smaller particles of certain chemical species.

Although we are reducing lower priority work in air quality modeling, we will maintain a strong focus on updating and refining the techniques needed by State environmental decision-makers to develop, adopt and enforce cost-effective control strategies.

Water Quality

Research in the entire Water Quality medium is funded at a level of $27,710,100 and 285 permanent workyears for 1983. In comparison with 1982 levels, resources in the Water Quality medium have been reduced by $17,379,600 and 79 permanent workyears. This medium contains three distinct research programs. Water Quality provides the necessary scientific and technical information to select the most appropriate water quality goals, assess current and future water quality problems, and identify cost-effective water quality management strategies. Municipal Wastewater furnishes the engineering and health support needed by the regions, States, and municipalities to assist in the construction of cost-effective sewage treatment plants. Industrial Wastewater provides scientific data for insuring the dependability of Agency regulations and policies.

In fiscal 1983, the Water Quality research program decreases by $8,099,400 and 35 permanent workyears. The substantial progress made in recent years in scientific assessment, health, monitoring and environmental effects research has made much of this reduction possible.

The Municipal Wastewater research program declines by $4,936,600 and 34 permanent workyears. This program has been streamlined to focus the bulk of its resources on evaluating better sludge management approaches, promoting the use of innovative and alternative technologies (in close cooperation with the Construction Grants Program) and improving the operation and maintenance of existing wastewater treatment facilities.

Finally, since the effluent guidelines regulatory program no longer needs intensive R&D support to assess the operating characteristics of control technologies, it has been possible to reduce the Industrial Wastewater research program by $4,343,600 and 11 permanent workyears. The bulk of this reduction is in the engineering area, where attention will shift to identifying least-cost pollution control options for use by industry (especially those for small economically disadvantaged industries).

Drinking Water

The Agency is requesting a total of $22,905,500 for drinking water research in Fiscal Year 1983. This reflects a decrease of $5,448,000. Permanent workyears will drop by 12 to 132. The drinking water research program will continue to provide support to the Office of Drinking Water in the development of Maximum Contaminant Levels (MCLs), Revised National Primary Drinking Water Regulations and guidance to States and municipalities. The 1983 program will also continue

the research emphasis on transport and fate and monitoring of ground water contaminants, which supports Agency programs to control hazardous wastes (RCRA and Superfund), as well as the drinking water program.

Hazardous Waste

We are requesting a total of $29,579,200 for this medium in 1983, an increase of $90,900, which will reflect an increase of 27 permanent workyears to 130. This represents increased emphasis on health hazard and environmental assessments. The increase in hazard assessments will enhance the Agency's ability to predict the human health risks associated with releases of hazardous wastes into the environment. Products will include hazard profiles for specific chemicals and quantitative risk assessments for high priority chemicals of concern. In the monitoring area, the development of rapid and simple identification, screening and monitoring methods, as well as quality assurance techniques, will continue.

Pesticides

Our 1983 request for pesticides research is $6,468,800, supported by 72 workyears. We will expand scientific support to the Office of Pesticide Programs to assist EPA in the registration or re-registration of pesticides. Emphasis will be on the development of more cost-effective environmental and public health risk assessment techniques, new or improved pesticide testing protocols, and direct scientific and laboratory support to assure that the data being used for regulatory purposes is of the highest quality.

Non-ionizing Radiation

The 1983 radiation research and development program is planned to total $1,586,400 and 21 permanent workyears, a decrease of $958,800 and 1 permanent workyear from 1982. This decrease reflects a reorientation of non-ionizing radiation health effects research and a shift to augment critical radiochemical quality assurance efforts.

Interdisciplinary

The 1983 proposal for the Intermedia research and development program is $4,212,700 and 12 permanent workyears. The decrease of $1,490,900 and 12 permanent workyears from 1982 results from a reduction in National Environmental Workforce activities and termination of some strategic assessment studies.

Toxics

Resources for the 1983 toxics research program are set at $26,648,800 and 154 workyears, which reflects a decrease of 16 permanent workyears and $4,527,100. This decrease results from the completion of many of the test methods required for the initial implementation of the Toxic Substances Control Act (TSCA) coupled with increased reliance on in-house research capabilities. The 1983 toxics research program will emphasize the continuation of development of more cost-effective, better, faster test methods and validation of existing test methods and models for defining fate, exposure and hazard of chemicals to humans and the environment.

Energy

The 1983 budget provides $34,530,200 and 62 permanent workyears. This represents a decrease of $18 million and 70 permanent workyears.

Research on air, water, and solid waste releases from synthetic fuel development processes will be continued, but at a reduced level, with greater emphasis on developing integrated health and environmental risk assessments and providing technical assistance to the regions and States and a decreased emphasis on developing alternative control technologies. We are shifting emphasis, as I mentioned earlier, because it seems premature to conduct further research on some synfuel control technologies until commercial facilities are built and because the synfuels industry itself has both the capability and resources in many instances to develop needed control technologies. For example, of 32 major oil shale and coal gasification projects in the western United States in 1980, only two have since moved into construction on a commercial scale plant, while five have become totally inactive. Most of the balance have slowed down their activities and kept them on the level of preliminary assessments.

Resources for research on acid precipitation will be increased by $3 million to accelerate EPA's efforts to respond to unanswered questions about the causes, effects and methods of mitigating or controlling acid rain.

Program Management

The 1983 budget for Program Management totals $4,011,500 and 49 permanent workyears. In comparison with 1982 levels, resources have been increased by $368,700 (with staffing reductions of 19 permanent workyears).

The decrease in program management staffing levels reflects a streamlining of headquarters operations and more effective administrative and management responsibilities. There will be greater use of automated systems to perform routine information gathering and administrative activities.

The increase in Program Management funding levels will be used to offset increased operating costs and to further develop the information systems noted above.

Superfund

Research in this program consists primarily of adapting existing technology and information to the needs of personnel charged with cleaning up uncontrolled releases of hazardous substances. The Agency proposes a total of $6,336,000 and 25 permanent workyears for this program in 1983, a decrease of $7,541,100 and 6 permanent workyears from 1982. These decreases reflect the fact that a large portion of the technical support required to initiate the superfund program will be completed or brought to near completion in 1982.

I would now like to turn to the other areas mentioned in your letter of invitation.

Role of the SAB

The new process for improving the scientific adequacy of EPA's regulations and standards requires that scientific data supporting selected significant regulatory actions be submitted to the SAB for review.

Under this process the Deputy Administrator selects 15 - 25 rule packages, based upon recommendations of the Science Advisor and the Director of Standards and Regulations, for SAB review each fiscal year. The SAB will review both the scientific data and a comprehensive scientific issues paper which identifies all major scientific issues related to the proposal, significant areas of scientific uncertainty and key scientific studies, and its possible interpretations. The SAB participation is concerned solely with the scientific basis of the proposal and confers no authority to approve or disapprove the action. Its review is to be completed within 90 days after submittal of the material. The work group which developed the regulatory package will then make appropriate modifications before submitting the proposed regulation to the Steering Committee. The SAB comments will accompany the package through all subsequent reviews.

The benefits to EPA of this SAB review process include: explicit and early review of scientific data supporting rulemaking action; an independent source of advice for the Administrator prior to publication of a proposal; and increased public acceptance of EPA's regulatory actions.

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The Science Advisory Board has been restructured and now consists of five committees: the Executive Committee, the Environmental Health Committee, the Environmental Effects, Transport & Fate Committee, the Environmental Engineering Committee, and the Clean Air Scientific Advisory Committee which is chartered separately.

In selecting new SAB members, nominations are received from present SAB members and a number of individuals and groups from outside EPA. They are chosen for their expertise in scientific disciplines needed for the SAB scientific review and to give representation to various schools of scientific and engineering thought. The Administrator appoints new members from this list of nominees to terms ranging from one to four years.

Management Study on ORD Reorganization

As the Subcommittee is aware, we have been examining better ways of organizing, planning, and managing the EPA research effort. The first phase involved a detailed look at R&D Headquarters' mission and organization. That work is now almost completed, and we are in the second phase, addressing our field laboratory structure. We are focusing on the relationships between Headquarters and the field and on the relationship between the laboratories in each major scientific area.

The group addressing Headquarters has largely completed its work. The laboratory task force will be working through March, and should have final proposals ready early in April.

Based on what I have seen so far, I am quite enthusiastic. I believe that our staff has managed to retain the best elements of the current planning and management systems, and combined them with a new organizational structure which will stress accountability, facilitate clear and more direct communication between ORD and the regulatory programs, and, most significantly, establish Headquarters as the focal point for developing strategic plans and policy guidance, and make our senior laboratory officials responsible for day-to-day research implementation and management.

I anticipate that all of our proposals will be completed before summer, and I look forward to sharing the details with you as soon as possible.

Conclusion

In conclusion, Mr. Chairman, I feel our research budget is both realistic and environmentally sound. Our proposal focuses on fulfilling our statutory mandates for environmental protection, while complying with the President's effort to reduce Federal spending. All rhetoric to the contrary, better and more pertinent research and fiscal responsibility are not mutually exclusive, and in our efforts in the year ahead, we intend to ensure that both go hand in hand.

As I have declared, time and time again, this Administration's agenda is not secret, but clear and overt -- a strong Environmental Protection Agency to meet the environmental protection goals of the Nation. That strong EPA depends upon what we do with our research programs, and that is why we intend to concentrate our efforts on better research, on focused research, and upon improved science behind our programs.

We have good people and a good program, and I am proud of both.

Thank you, Mr. Chairman.

Mr. SCHEUER. Thank you very much, Madam Administrator.

I have three or four questions to ask you, and I will stick rigorously to my 15 minutes. We hope if you can give reasonably brief answers to my questions, I will have a chance to get to them.

Let's start with a view of history, the Eleventh Congressional District in New York.

As you are well aware, the New York State Senate Committee on Crime has brought serious allegations that more than 50,000 gallons of toxic waste, dangerous toxic materials, have been deposited at the Pennsylvania Ave. landfill, right across the street from Starrett City, a major development in New York City adjacent to Jamaica Bay and the beautiful water environment of New York.

This investigation has disclosed that a number of out-of-State waste disposal companies have been systematically, repeatedly, dumping toxic wastes in Jamaica Bay over a period of several years, from 1968–79. This has created widespread concern among both community leaders and public officials and area residents.

On February 2 of this year I sent you a letter asking EPA to conduct an examination of that landfill to determine whether it presented a threat to the public health and environment.

While there have been some informal consultations that have taken place between our office and your regional officials, we have not gotten a formal answer from you yet.

I was hoping that at this point, on this occasion, you might respond to our request and tell us what you found and tell us whether this is the type of problem that we are likely to get as you proceed further to relax your regulations concerning the dumping of toxic liquids and other toxic wastes.

Ms. GORSUCH. Let me answer the last part of your inquiry first.

We do not intend to relax any standards that would result in condoning the dumping of toxic wastes. The situation that you described would have been prohibited by our regulations throughout that period of time, whether I was on board or not. Indeed, we have made a very real attempt to try to bring the original proposed RCRA regulations into a better semblance of order for use by the regulated community.

The dumping of toxic waste would not be condoned under our regulations at this time or any time in the future that I could reasonably predict.

As to your specific request for monitoring at the Starrett City site, I am pleased to announce to you that we can begin such monitoring next week with both a mobile laboratory and a helicopter for air sampling.

Depending upon what those samples indicate, we would proceed accordingly. We are very pleased to be able to accede to your request to monitor at that area beginning next week.

Mr. SCHEUER. Very good. I am very much encouraged at that. Let me gradually widen our perspective from this Mosley view of history in my district to the continental problem or global problem of acid rain.

We are very well aware that you have increased the budget in acid rain. We congratulate you on that. It was a significant increase of about 25 to 30 percent. We take note of that as an exception to an otherwise gloomy and depressing picture. But in every

cloud there is a silver lining, and perhaps this is the silver lining in the EPA 1983 budget plan.

Let me say a State Department spokesman was quoted in the newspapers as saying:

> We have responded fairly and effectively to the Canadian concerns on acid rain on Great Lakes research. We have assured them we will have a Great Lakes research program.

Now, I have just come back from the latest in a series of interparliamentary conferences that I and a number of other Members of the House and Senate have attended with members of the Canadian Parliament. This is at least the third or fourth meeting we have had with them in the course of the last year.

I can tell you that they feel a deep sense of concern, bordering on outrage, that we are not living up to our commitments on acid rain and we are not living up to our commitments on ameliorating the deplorable conditions of the Great Lakes.

We have a diplomatic agreement with them that commits us to an assiduous and systematic approach to the Great Lakes. They are well aware that of our Great Lakes progam, our research program that has two prongs, you have eliminated one and reduced the other by two-thirds.

They do not feel this is good faith compliance. I have to ask you whether the State Department spokesman who says that we have responded fairly and effectively to their concerns, speaks for your agency? In view of the fact that you have virtually wiped out your Great Lakes program; and from my personal observation their perception is that you not only have not fairly and effectively responded to their concern, but you very clearly have drawn back from the written diplomatic commitments we have with the Canadians. We have drawn back from President Reagan's personal assurance to Prime Minister Trudeau in Ottawa that we would deal effectively and fairly with the problems of acid rain and the problems of the Great Lakes.

Ms. GORSUCH. I would take issue with the conclusions that apparently the Canadians have reached in terms of reduction or wiping out a commitment to the Great Lakes. Nothing could be further from the truth.

The Great Lakes are one of our very valuable natural resources. Our efforts in Great Lakes research have been really twofold: In terms of what we classify as research, we have expended some $31-plus million. This research was conducted to study eutrophication and toxic pollutants in the Great Lakes area.

There is another component, and that is monitoring. What is going into the Great Lakes? We need to measure as we go along. That ongoing monitoring effort is contained in our 1983 budget proposal at about $3 million. It doesn't appear in the research part of our books, but it is obviously an ongoing component in our meeting of commitments both from our natural resources and our concerns with Canadians.

In terms of the research, the dioxide and the phosphor studies have been followed into overall research rather than being specified to a local Great Lakes program.

We will be conducting continuing research in the areas of concern, which are broader than the mere local applications of the Great Lakes, but it would certainly have application in our treatment of the Great Lakes.

Before we go into the acid rain, I would like to finish this particular aspect of the Great Lakes concern by asking Dr. Hernandez to bring the committee up to date on our ongoing negotiations with Canada.

Mr. SCHEUER. Would you specifically tell us, No. 1, whether in your perceptions this cut of your monitoring program of about $10 million now to $3 million is designed to give them confidence that we really mean business? And second, have you answered their request of over 1 year ago for clarification on what our posture is on meeting our commitments, and if you haven't yet, when do you plan to give that written commitment?

Dr. HERNANDEZ. I am not sure of the numbers, but I think the decline in monitoring may be on the order of $1.6 million rather than the difference between $3 million and $10 million. I think the most we spent on the Great Lakes in any year has been on the order of $7 to $8 million. I am not sure of that. I don't have the total budget spent over the years, but it is on that order of magnitude. We have been in negotiations with the Canadians on an amendment to Annex Three of the 1978 agreements. There was a meeting in April of this past year where they drafted a proposal on target loads. We have been in the process of refining that, going back to the States involved because each of the States has to commit itself to be willing to carry out some aspects. The major one is to assign moneys for wastewater treatment facilities; that is, grant moneys we provide through the Federal Government, but that the State allocates to those plants on the Great Lakes so we can have advanced wastewater treatment, including phosphorus removal. It means we have to commit much of the States' moneys to those things. So, we have sent the proposal to the States. In January we received concurrence on the latest version, and at the present time we are considering the resource implications of a part of the agreement with Canada which requires that we continue to do research on phosphorus.

Here we believe essentially much of the research is completed. We would be interested in doing some demonstration projects. If these qualify, then I think we can reach an agreement with them.

Mr. SCHEUER. Dr. Hernandez, I am a Member of the American Congress, I am not a member of the Canadian Parliament. But putting myself in their position, I can understand their utter frustration at hearing a story from the Americans; before we meet our binding written commitments to move forward we have to confer with the States and see whether they are going to contribute their part of the funding. If the Canadians told me that as an American Member of Congress, that they had to go to their seven or eight provinces, I would say, listen. That is your problem. We have a binding agreement with the Canadian Government that they are going to do, A, B, C, D and E. Where you are going to come up with the funding is your problem but we don't expect this to lag indefinitely while you talk with your various provincal governments to see whether they are going to cooperate or not.

I can understand their frustration to see this thing dragging out while we go through the exercise in a time of enormous financial constraints on everybody of seeing whether the various States involved here are going to play the role we have assigned to them under the new federalism.

The New Federalism should not be dumped in the lap of the Canadian Government as their problem. This is our problem. I must confess that, although as I said, I am a Member of the U.S. Congress and not the Canadian Parliament, I can empathize completely with their utter frustration at the answer you have just given us.

Ms. GORSUCH. Let me attempt to clarify. New federalism quite apart, the construct of our laws requires that further reductions in phosphorus loadings would have to come from nonpoint sources, sources that are not sewer treatment plants, but sources that are scattered in other directions. Under our current law——

Mr. SCHEUER. What is happening to your research on nonpoint sources?

Ms. GORSUCH. Mr. Chairman, if I could finish first, then I would like to go into that. It is nothing new, but rather an ongoing implementation of the statutes Congress has given us that require us to seek the cooperation of the States. If they can't assure a reduction in that area, there is no Federal mechanism that can guarantee it. That is separate and apart. Our negotiations on Annex 3 continues. Contained within those negotiations is a commitment, again, as a negotiation, for continued research. If those negotiations are completed to the satisfaction of the mutual parties, indeed we would be having to come to you to request additional funding in that particular exercise.

Mr. SCHEUER. Aren't you eliminating, in your request for funding this year, the request for nonpoint research?

Ms. GORSUCH. No, Mr. Chairman. I think it would be more adequate to say that the nonpoint source planning that was done under the Clean Water Act was terminated.

Mr. SCHEUER. Yes.

Ms. GORSUCH. There is money under the Clean Water Act, considerably more money than has been present before, for the States to meet their commitments under the Clean Water Act. We hope to be encouraging those States where they have nonpoint source problems to be using this money in that regard.

In other States there will be a need to sue them for revision of the standards. But there are additional moneys in the construction grants aspect of the Clean Water Act for that specific purpose. I should say not for that specific purpose, but which we hope to see applied for that specific purpose where needed.

Mr. SCHEUER. I must say I share the Canadian's sense of uncomprehension, compounded by frustration.

Ms. GORSUCH. I understand that, and it is unfortunate because I think it is just too simple to look at a budget proposal that indeed proposes termination of one activity, and interpret that as somehow a lack of commitment to an ongoing program. It is too simplistic an approach.

Mr. SCHEUER. If the ongoing program were ongoing, I do not think we or the Canadians would care where the money came from

or what gyrations are exercised. But when the activity and research stops, and the ongoing programs are failing and there is nothing going on out there in the field, then to have this kind of convoluted explanation of why the momentum is being lost gives all of us in this transboundary question, all we Members of the Parliament, American Congress and Canadian Parliament, a sense of frustration.

Ms. GORSUCH. Perhaps we should make the record very clear and describe what we will be continuing in our research development which is relevant not ony to the Great Lakes but to our other concerns in water quality.

I would ask Dr. Riordan to elaborate.

Mr. SCHEUER. Ms. Gorsuch, let's do that for the record. We are going to ask you all kinds of additional questions for the record since your time is limited this morning but I am going to restrict myself to the same 15 minutes other Members will have. And I do have another couple of questions.

So, with your patience, Dr. Riordan, if you would prepare that for the record I would appreciate it.

[The information follows:]

Considerable research is conducted by the Office of Research and Development beyond that under the Great Lakes Research budget area that is applicable to problems of the Great Lakes Basin. Much of the research under the Water Quality and Toxic Substances budget categories also are applicable to the generic toxic pollutant problems common to many parts of the United States, including the Great Lakes. The following research planned for fiscal year 1983 is among that equally relevant to the Great Lakes Basin:

WATER QUALITY AND TOXIC SUBSTANCES RESEARCH

Development, refinement, and testing of a predictive model for characterizing the transformations, persistency, and fate of toxic organic chemicals in fresh surface water systems ($800K).

Development, refinement, and testing of a predictive model for characterizing the transformations, persistency, and fate of toxic metals in fresh surface water systems ($200K).

Characterization of the health and ecological effects of selected toxic pollutants in freshwater systems (chosen by the Agency's operational programs) ($600K)

Upgrading of wasteload allocation model for rivers to provide a capability for addressing toxic organic pollutants ($250K).

Development of predictive methods for screening fate and environmental toxicity of new chemicals ($300K).

Development of a technique for predicting a chemical's behavior, fate, and effects based on its chemical structure ($1900K).

Development of standard tests for more cost-effectively and accurately determining the health effects of toxic chemicals ($4000K).

Development of standard tests for more cost-effectively and accurately determining the ecological effects of toxic chemicals ($500K).

In addition to the above, there is research on measurement methods and pollution control technology that would have application to all areas of the United States, including the Great Lakes.

Mr. SCHEUER. Let me go on to the question of energy R. & D. Here, Ms. Gorsuch, you are involved in a quantum jump in our national energy policy. We have made a national determination to lessen our reliance on Persian Gulf oil, and to produce other oil as well as nonpetroleum substitutes. We are talking about synfuel, coal conversion, geothermal, biomass, solar, waste, tidal, and a host of alternatives. We are particularly concerned about the health and environmental effects of coal conversion and synfuels. I think

Congressman Gore is particularly concerned about health effects. We have talked about environmental effects, acid rain in the Great Lakes.

In your testimony you said your research is ahead of the actual commercial applications of synfuel and coal conversion by the private sector. You have also said research is an appropriate function to them. Now, I really fail to understand either of these approaches and want to ask you to clarify your position.

Should not both the health effects which Congressman Gore will center on and the environmental effects and control technologies to limit them, should not this be developed before we even start on a commercial scale development? Should not this whole job be done to provide the coal technologies which can be cranked into the original design of commercial scale development of both synfuels and coal conversion? That is my first question. And the second question is, Where is your confidence that the private sector is prepared to do this kind of research and development? We have been in touch with the private sector informally. We have gleaned no signals whatsoever from them that they have the slightest interest in engaging in what they consider these rather obtuse and esoteric research programs. They feel they are in the business of applied science. They very much support the business of the basic research and development of the control technologies by Government. The private sector believes that this is a proper Government function, to tell them what the control technologies are that are adequate to do the job so that they can go on with the appiled research and development that they consider their real function.

Please clarify your position on these two things: A, whether it doesn't make sense for you to be further ahead of commercial applications than you are so you can give the industry the guidance they need from the time they put the first pencil to paper on planning these enormous new installations that will cost hundreds of billions of dollars. And, second, whether you have had any assurance from industry as to whether they are willing and able to take over this function at a time when the prime interest rate is 16.5 percent and they have to pay a point or point and a half over prime, whether you have had any indication from them that they are willing to undertake this kind of research and development function.

Ms. GORSUCH. Mr. Chairman, I think we are talking about two levels of research—those on the health effects, or the effects of pollutants on health, welfare, and the environment; and the control technologies that are appropriate for controlling those effects.

If you will recall, during my testimony before this committee some months ago, you indicated you had indeed been in touch with the synfuels industry involved which felt it was the appropriate role of the Federal Government to do the research on the health effects, on what will happen to populations given certain levels of pollutants. In effect, to set the speed limit for the developing industry in this regard. We also concurred, it is my recollection, that the Federal Government's continued role in providing control technologies should be somewhat more limited; that once we had indeed set the speed limit through long-term research on what were the effects of this type of industry, it really should be more the func-

tion of the industry involved to develop control techniques that were, one, appropriate to that speed limit, and, two, suited to their particular development.

That is essentially what our research proposals indicated to you.

Mr. SCHEUER. Do you have any assurance from them that they are willing to accept that burden and that challenge?

Ms. GORSUCH. Mr. Chairman, I don't have any personal assurance from them that they are. I do tell you, though, that in the overall, we have invested approximately $30 million in the energy program performing health, environment and control technology research for synthetic fuels. We are recommending a reduction in this area that we think is commensurate with where we are vis-a-vis where the industry is.

Most of our research has necessarily been on pilot programs. We feel our efforts in the future should be directed to the real world when we have actual plans going into function. For that reason, we will be focusing in terms of this budget on getting actual technical assistance through our regional office to permittees, to folks that will be constructing these plants and seeking water and air permits.

Likewise, we will be opening up a dialog with the Synfuels Corporation to begin the permit process for those synfuel projects that will be funded through that Corporation.

I would also like Dr. Riordan to elaborate in this particular area.

Mr. SCHEUER. I would again ask Dr. Riordan to elaborate for the record. My time is finished and I still have one question to ask before I yield to my colleagues.

[The information follows:]

Section 131(e) of the Energy Security Act requires recipients of aid from the Synthetic Fuels Corp. (SFC) to develop health and environmental monitoring plans and to consult with EPA, DOE and the States in so doing. In responding to the mandate of section 131(e), EPA personnel have been meeting with representatives from both DOE and the SFC to determine the respective roles of each organization. Although many issues still need to be resolved, EPA's Office of Research and Development is preparing source and ambient technical monitoring reference manuals for various synfuel processes. These documents are designed to assist the regional staff in their discussions with industry on monitoring plans, and to serve as a reference document for SFC applicants.

In addition to the preparation of these monitoring manuals, EPA has reviewed the monitoring plan for the proposed Memphis Light, Gas and Water synfuel facility. EPA plans to continue to provide them with technical guidance, and as other applicants require similar guidance, EPA will provide support in the review of Environmental Impact Statements and permit applications.

Mr. SCHEUER. Ms. Gorsuch, you mention in your testimony that you intend to tighten up on management, make management more efficient and cost-effective and we all applaud that general goal.

There are three things happening that give us pause and make us wonder whether this deep-felt concern about cost-effectiveness is real.

First, you are under a statutory mandate to give us a 5-year research plan. A year and a quarter has gone by. We have received no 5-year plan. Second, there is no head of your research division over there. It has been a headless horse. We don't think this contributes to efficiency or cost effectiveness.

Third, your Science Advisory Board. It is our understanding, and I would welcome the correction if we are wrong, you are making no

reappointments of present members to the Science Advisory Board, and that all the prospective vancancies will be filled by new appointees.

It seems to us this would deny the Agency the benefit of continuity. It would deny the Agency the benefit of institutional memory, it would deny the Agency the benefit of the extraordinarily distinguished and talented members who are now serving on your Science Advisory Board, many of whom would like to continue.

It seems to me that these three characteristics of your policy, nonproduction of a 5-year plan, nonappointment of a head of your research program and this demoralizing policy on your Science Advisory Board, symbolizes your problem. Morale is bad at EPA, and you are quite aware of it. And it is perfectly common knowledge that you have serious management problems.

How do you square your alleged determination to improve efficiency and management cost-effectiveness with these three aspects of management which seem to us to be clearly counterproductive to good management, to effective management, to cost-effective operations?

Ms. GORSUCH. Well, Mr. Chairman, the assertion that morale is bad and that we have serious management problems simply is without foundation. Indeed, there have been morale problems at the Agency, mostly due to, in my opinion, the headlines that were simply without foundation that preceded the presentation of this budget.

As you will recall——

Mr. SCHEUER. You will agree with President Reagan that the press is being unfairly critical and negative about your operations as they have been about his conduct of the Nation's business?

Ms. GORSUCH. No, Mr. Chairman, the press carried merely the rumors available at the time. Those rumors were that there were going to be 80-percent cuts and 50-percent cuts. It is strange now that the facts are out, they are not making the same headlines. The facts are that we are seeking a reduction in the operating budget of this Agency of 12 percent. The facts are that we are seeking this cut against a background of an agency that grew by 62 percent between 1977 and 1980.

Those are the facts. Morale was, I think, impaired seriously during a period of time when the only available information were groundless rumors. We were not free to give the specifics of the budget prior to the President's announcement to Congress. Now that the facts are out, now that our employees have seen what a real budget contains and that they have been assured we will not have any reductions in force due to budgetary constraints in 1982 and that we foresee that we will be able, provided certain givens in 1983, to follow the same procedures, we think that that has been largely cured.

Mr. SCHEUER. Ms. Gorsuch, do you wish to make any specific answer to my questions about nonproduction of the 5-year plan, the nonappointment of a head of research and your policy on nonreappointment of any members whatsoever of your Science Advisory Board?

Ms. GORSUCH. I certainly do, Mr. Chairman.

Mr. SCHEUER. Please do.

Ms. GORSUCH. The 5-year plan will be forthcoming in the very near future.

Mr. SCHEUER. Can you give us a date, time frame? It is a 1½ years now. What does the very near future mean? Does that extend beyond 1984?

Ms. GORSUCH. No, Mr. Chairman, it does not.

Mr. SCHEUER. Can you tell us what it does mean?

Ms. GORSUCH. I would think in the next 6 weeks.

Mr. SCHEUER. Very good. How about the appointment of a head of research for EPA?

Ms. GORSUCH. We have a very competent head of research in EPA. He is sitting to my right. He is the Acting Administrator, Dr. Courtney Riordan.

Mr. SCHEUER. Is he being considered for the permanent position of head?

Ms. GORSUCH. Mr. Chairman, the field is wide open.

Mr. SCHEUER. It has been wide open for a 1¼ years. We think somebody ought to bite the bullet and give us a head of research. Can you give us an estimate of when that appointment may be made?

Ms. GORSUCH. No, Mr. Chairman, I cannot.

Mr. SCHEUER. Don't you think after 1¼ years we have the right to some assurance that there will be an appointment of head of research?

Ms. GORSUCH. Mr. Chairman, as you may know, and I am not sure you do, that particular process is not mine alone. Indeed, I do make recommendations. But each of my assistant administrators is recommended by the President and confirmed by the Senate.

Mr. SCHEUER. Right. Have you made a recommendation for the appointment of head of research?

Ms. GORSUCH. No, I have not.

Mr. SCHEUER. Do you plan to make one in the near future?

Ms. GORSUCH. No, I cannot tell you that I have any plans in the near future to recommend——

Mr. SCHEUER. Why is it you have no plans even to recommend a head of research for EPA?

Ms. GORSUCH. Well, Mr. Chairman, I will tell you that our search for such a person has been ongoing and difficult. It is an enormous job. If you look at the salary levels and look at the qualifications necessary, you will see most people that would have to be considered would be taking a serious financial sacrifice.

Another group of people have simply been precluded because of the very stringent conflict of interest laws presently on the books. The class narrows. Those are the constraints under which we have operated. If I may, to answer the third part of your question, I would like Dr. Hernandez to comment on our policy in terms of appointments to the Science Advisory——

Mr. SCHEUER. Could you briefly, Dr. Hernandez, because I am robbing time from my colleagues.

Dr. HERNANDEZ. Yes, sir. We had seven SAB committees when we came in. The SAB executive committee recommended that we reduce the number to four committees. Many of these committees have grown in size to 18 members.

In order to make it a more effective body, we are aiming at memberships on the order of 8 to about 11.

Mr. SCHEUER. Do you plan to reappoint any of the current members of the SAB?

Dr. HERNANDEZ. Our plans are not to appoint them because we believe there are a lot of people with equal abilities in the field.

What we have done, sir, is reappoint, as consultants, people who have served on these committees so that we do have a continuation of their input and their usefulness. Since coming in we have reappointed about 70 people who have been consultants to the agency, many of them members of the SAB and past members of the SAB. We have only appointed four people to the SAB since we have come to EPA, sir.

Mr. SCHEUER. How many vacancies have you had since you have come in? How many vacancies are there now on the SAB?

Dr. HERNANDEZ. In terms of the reorganization of the two committees, there are probably about 20.

Mr. SCHEUER. Mrs. Gorsuch, I don't want to prolong this because I am now functioning on time that belongs to my colleagues. I must make the observation that, to me, it is possible that your difficulty in finding a qualified person to head up your research division, which should be an exciting and challenging job, and the fact that you cannot seem to find a single qualified individual who is willing to make that sacrifice to serve as head of research for EPA in a time when EPA is involved in massive ocean, sea of changes in national policy in energy and other fields, may indicate the depth, severity, and seriousness of the morale problems at EPA.

I am making that suggestion, I am not making a charge. But I think it is something you ought to mull over very seriously. I am deeply concerned at the fact that after 15 months in office you haven't even made a recommendation to the President on a qualified person to fill that role. I now yield to the Ranking Minority Member, Congressman Carney of New York.

Mr. CARNEY. Thank you, Mr. Chairman.

Ms. Gorsuch, I am concerned somewhat about the way we are going about the study of the problem of removal of sludge and removal of dredge materials. I would like to question EPA's role in this area.

More specifically we are looking at three methods of doing it: Ocean dumping, land, and incineration with sludge. And of course, there are two methods of doing it with the dredge material.

Could you give us an idea as to what EPA is doing in that area? Are you doing research to evaluate the three methods of sludge removal against each other, or are you going in an independent direction on each method of the removal of sludge material? Also, I know it is a long question, also there are other agencies involved?

Is there a coordinated effort between those agencies to insure that there is not a redundancy and to insure that we can come up with the best scientific answers as quickly as possible?

Ms. GORSUCH. Mr. Carney, I would like to refer your questions to Dr. Riordan for his reply.

Mr. CARNEY. Thank you.

Dr. RIORDAN. Yes, Mr. Carney. Problems of sludge are preeminent in our 1983 budget. The focus of our waste water research pro-

gram is now in three areas, one of which is innovative and alternative technology; the second is operation and maintenance, and the third is sludge management.

In terms of sludge management, we are concerned with the technologies for handling and disposing of sludges and also the effects associated with the disposal of sludge on land. This is one of the three primary focuses of the problem, and we are paying a great deal of attention to it.

In terms of the ocean disposal option, our primary concern has been characterization of wastes, and methods to characterize wastes, and assessment or prediction of the potential impacts upon the ecosystems in the ocean and estuary areas, assuming there is dumping.

We are carrying out a program in that area in great coordination with NOAA. NOAA's responsibility is that of how to monitor and what to monitor once it has been decided sludge disposal on land is realistic.

Incineration is the focus of our hazardous waste program. We now have a facility at Pine Bluff which will begin operation later this year to look at alternative means of combustion. We have a rotary kiln that is going into operation we hope sometime later this spring, and we will be looking at other technologies as well later on in the program.

Ms. GORSUCH. Your concern is well taken, Congressman, that there should be a balancing among our considerations, land and air, and the ocean.

Mr. CARNEY. That definitely is my concern. You are quite aware of the fact that there was a prohibition on ocean dumping that was to have ended December 31, then Judge Sofear ruled differently.

I am very, very sympathetic with those people who have a problem with sludge because we have not determined what is the safest method of disposing of the sludge.

Needless to say, we can't close our eyes and expect that it is going to disappear. Whatever we do select, we must make sure it is the best method. I am concerned not that we are going to find one that is perfect, but that these programs are going along on the same track. When we finish our research, let's say, ocean dumping, I hope we are not going to have to wait to find out what the pluses and minuses would be with land types of application, or incineration of the sludge.

Dr. RIORDAN. Congressman, I should point out that there is now an effort beginning on the part of the program offices to carry out a sludge management plan which will address the questions of regulatory programs, as well as the research programs.

So, we are attempting to bring those programs into phase with one another.

Mr. SCHEUER. Will my colleague yield briefly?

Mr. CARNEY. I would be glad to yield to the chairman.

Mr. SCHEUER. If you recall, last year we had extended discussions, both with your agency and with NOAA about the desirability of having a joint cross media research program that would tell us in 3 to 5 years as to the comparative costs and benefits of disposal of sludge (a) by land, spreading it out; (b) by air, by incineration;

and (c) by ocean dumping, either at the 12-mile site or at the 106-mile site.

As I recall it was agreed that this was absolutely essential and NOAA agreed to it. My recollection is that EPA agreed to it. Is there such a cross media study jointly conducted by EPA and NOAA ongoing at the present time?

Dr. HERNANDEZ. Mr. Chairman, about 2 months ago the head of our sludge program at EPA, who is in the water program, and I visited with Dr. Burns on the issue of coordinating both our monitoring and research and development with our ongoing regulatory development program. We are planning to issue those section 405 regulations, Clean Water Act regulations, by the end of fiscal year 1982 or early fiscal year 1983. We are looking at NOAA for the long-term component for what we will be able to do in the future. Ours is more developing criteria for these processes.

Mr. SCHEUER. Dr. Hernandez, can you get regs out without having done the comparative cost-effectiveness research on the three methods of disposal of sludge?

Dr. RIORDAN. We have ongoing in ORD at the present time a program to examine cost-effectiveness of the three technologies as they presently exist. Dr. Wiser could provide additional information on it.

Mr. SCHEUER. I would ask that to be submitted for the record.

[The information follows:]

The Office of Research and Development activities addressing the problems associated with Municipal Wastewater Sludge Management include three technology areas: Treatment, Conversion and Disposal.

The activities related to sludge treatment involve a number of technology sub-areas that have as objectives (a) preparing the sludge for charging to a conversion unit or (b) bringing the sludge to a final state or quality that will permit its removal from the treatment works site for disposal. Specific technologies addressed include methods for pathogen reduction and disinfection, dewatering and digestion (anaerobic and aerobic). Development of new or improved technologies for treating sludge is continuing due to the importance of these technologies for subsequent disposal options. The effectiveness, dependability, cost and energy conservation aspects are all critical to cost-effective and environmentally-sound sludge management.

Conversion processes include thermal, biological, and chemical ways to convert sludge into an aesthetically acceptable product. Several important developments are near or at the demonstration stage. Specific technologies addressed include evaluation of coincineration and starved-air combustion technology, characterization of emission from conventional sludge incineration, development of confined and unconfined composting processes, and assessment of emerging technologies which offer potential for producing energy or for converting sludge into useful products.

EPA has studied in detail the total particulate discharges from sludge incinerators. A standard for total particulate discharges has been established (0.65 g/kg dry sludge solids) and verified as attainable by state-of-the-art technology. ORD has examined further the makeup of these discharges to determine the fractional loss of volatile metals such as lead and cadmium. Experimental results show that fractional losses of these metals are substantially higher than for other metals; however, projected increases in concentrations in the ambient air at ground level are trivial, except for a few major cities where sludge quantities are very large. Even for these cases, available air pollution control devices such as electrostatic precipitators or fabric filters can recover these metals at acceptable cost.

Sludge incinerators must meet opacity standards, which present no problems. The limit for mercury in incinerator emissions is 3200 gm/day. Mercury is so volatile that most of it is lost in incineration. Fortunately, mercury levels seldom exceed 5 g/kg. Probably less than half a dozen treatment plants in U.S. would be troubled by mercury standards.

Historically, sludge incinerators have not been generally energy efficient and involve high maintenance requirements. Current dewatering devices such as belt filters and filter presses produce a drier sludge cake and thus use less fuel. A cooperative study with Indianapolis has shown that improved instrumentation and operation can greatly reduce fuel use and air pollution. The savings in fuel alone amounted to $1,000,000 a year which is about 40% of the annual fuel cost. Nashville and Hartford have had similar results.

Disposal, while meaning final disposition, inaccurately connotes what is involved. In practice, it means two things, namely beneficial use of sludge which has been converted into an acceptable material and disposal by burial or ocean dumping. While other technologies are being investigated, beneficial application of sludge to the land for agricultural purposes or for renovation of disturbed land is the most widely utilized technology today. Enough progress has been made to enable the development of best management guidelines for land application. More work is needed to confirm the safety of guidelines and to refine them in order to improve their ultimate cost effectiveness. Other agencies have legitimate concerns and responsibilities in these areas. EPA has recognized this interagency responsibility and has fostered cooperation with those involved, primarily the Department of Agriculture (USDA), Food and Drug Administration (FDA), and the Department of the Interior (USDI).

The objective of EPA's ocean dumping research is to develop hazard assessment protocols for the ocean dumping of wastes. Major components of this effort include waste characterization, site characterization, exposure assessment and effects assessment. Although these studies may not be done utilizing sludge, they do have applicability to the sewage sludge disposal problem. This research effort has been coordinated with the National Oceanic and Atmospheric Administration (NOAA) and the U.S. Army Corps of Engineers. In recognition of the different types of expertise, the three agencies are attempting to gain optional use of resources. In addition a mini-assessment is being done on ocean dumping. These short-term studies are used to identify additional research which needs to be conducted. A portion of this assessment is looking at trends (type and quantity) in waste production and comparing alternative disposal options.

There are ongoing studies to update existing cost models for sludge management alternatives to include available detailed cost studies of metro areas such as New York City, Boston, Philadelphia, and Los Angeles. These studies will provide current cost estimates for land disposal options for comparison among themselves and with ocean disposal costs. The work is part of the Agency Study Management Project under the aegis of the Sludge Policy Group.

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Mr. SCHEUER. I yield back to Congressman Carney, and this time that has been taken in this question will not be part of your time.

Mr. CARNEY. Thank you, Mr. Chairman. I will continue the question. I am not sure whose role this is? It could be NOAA's as well as EPA. But, there is a more refined method of incineration for sludge and that would be ocean incineration.

Is there an ongoing program to deal with that technique?

Dr. RIORDAN. At the present time we have been involved in evaluating ocean incineration, primarily in the area of what I would call high hazard wastes or toxic wastes. We have been involved in monitoring the results of some *Vulcanus* burns in the Gulf of Mexico. But I do not think ocean incineration would be practical.

At the moment we don't have that kind of research built into our program. I can provide for the record some of the costs we think are associated with the incineration of high hazard wastes or toxic wastes so you could have an idea of the relative costs that might be associated with that technique.

[The information follows:]

There is a wide variation in the costs associated with the incineration of hazardous wastes. For example, the cost to incinerate a ton of wastes containing hazardous materials in a land-based incinerator can range from as low as $100/ton to $500/ton or more depending on the chemical composition of the waste, the heat content of the waste, the location of the incineration facility, and the profit margin added by the incinerator operator. These estimates will be refined as additional data becomes available.

The cost of incineration at sea, such as aboard the *Vulcanus*, is also difficult to estimate. The Maritime Administration has estimated that it cost about $4,800/ton for the initial trial burn incineration run aboard the *Vulcanus*. It is estimated that future burns will have an approximate average cost of $2,000/$2,500 per ton. These estimates will also be refined as additional data becomes available.

Mr. CARNEY. I would appreciate that. Could you give us an explanation of EPA's involvement with the Corps of Engineers and with NOAA as it pertains to dredge material?

Dr. RIORDAN. EPA research progam? As it pertains to——

Mr. CARNEY. Maybe I should ask if you are involved jointly with the other two agencies in the evaluation of dredge material and what to do with dredge material?

Dr. RIORDAN. We have carried out a dredge disposal program at the Corvallis Laboratory. I do not know whether we specifically were involved in joint efforts with NOAA. But that has been brought to the point where we have provided criteria to the program office in its assessment of dredge disposal activities and its assignment of permits. The program has come to completion; we have provided the criteria; and the program office seems satisfied with the research we have done.

Mr. CARNEY. The monitoring of the sites, is that an EPA role?

Dr. RIORDAN. Monitoring of ocean sites would be NOAA's responsibility.

Mr. CARNEY. Thank you. Ground water research has been maintained at the 1982 funding levels of about $5.5 million. In publishing the ground water research program plan, the Agency has set up a 5-year schedule for research and development. Does the Agency intend to maintain this schedule and can it do so given that level of funding of $5.5 million?

Ms. GORSUCH. Again I would like Dr. Riordan to be specifically responsive to that, Mr. Congressman.

Dr. RIORDAN. I am sorry. I was diverted for a moment.

Ms. GORSUCH. On the research program, can it be maintained at the level of funding we are requesting, the 5 year——

Dr. RIORDAN. The 5-year research plan we are going to be providing will be maintained. One of the reasons for the delay in the production of the 5-year research plan is an attempt to make it come into phase with what we think are the necessary research in terms of the agency regulatory programs.

Mr. CARNEY. What you are saying, it is not a matter of funding, it is a matter of synchronizing the advances with other responsibilities?

Dr. RIORDAN. I am sorry. I had been referring to the 5-year research plan. The ground water research plan has been worked out very carefully with the program office. From what I understand, the problems which have been identified by our researchers have been adequately accommodated, and are in concert with the regulatory program office policies.

Mr. CARNEY. If it is in concert with that, would it be practical or feasible to accelerate the program if more funds were available?

Dr. RIORDAN. I would say not. The ground water research plan we have developed is looking at some pretty fundamental questions that are associated with the transport, transformation and fate of chemicals in the underground environment. Until we solve some of the critical questions associated with the effects of filtration and microbiological action, chemical transformation in the underground environment, I do not think we could improve the building base of the Agency's community by spending more money.

Mr. HERNANDEZ. Mr. Carney, if I might add to that, in the last couple of months we have met twice with the USGS, and we have adopted a new memorandum of agreement. We have a joint research committee set up and functioning on coordinating their research work with ours. They are doing a number of things dealing with toxic materials and their movement in the hydraulic sense in ground waters.

That coordination will supplement our program quite well. Last week in a coordination effort, our people from Ada, Okla., where our ground water program is centered, came in and met with the program people in the hazardous waste, Superfund and drinking water areas to coordinate research. So, I believe there is a good working relationship amongst R. & D. people with the programs and there is a clear understanding of what is going to be done.

Mr. CARNEY. Could someone address the decreases in personnel levels as far as the distribution is concerned within EPA? How many people were cut out of the administrative end, how many people who you might want to call belly to bench scientists were cut out, and how many people were Ph. D. levels, technicians, et cetera? Is there any type of breakdown in that area?

Ms. GORSUCH. Mr. Congressman, we can provide it.

[The information follows:]

The Office of Research and Development's permanent full-time workyear (PFTE) ceiling was reduced from its fiscal year 1982 level by 251 in the fiscal year 1983 President's budget. At this time, it is not possible to provide an exact breakdown of

the types of positions that will be abolished. There are two primary reasons for this. First, detailed studies of ORD's structure in both headquarters and the field are being conducted. The final recommendations from these should be available later this year and after the specific allocations are made location by location in our operating plan. These will contain proposals for staffing and will give a better estimate of the types of positions and numbers of each type that will be eliminated. Further, we hope to be able to absorb most of the reductions by attrition, and it is hard to predict exactly what types of people will voluntarily leave ORD.

Ms. GORSUCH. Let me say that to date, and again, this is notwithstanding great rumors, to date since our administration took over, there have been I believe the number is 100 involuntary separations from the agency. That is since May of 1981.

Mr. CARNEY. Total?

Ms. GORSUCH. That is total.

Mr. CARNEY. I would have to agree with you, Ms. Gorsuch. Reading the Washington Post I thought it was 91 a day.

Ms. GORSUCH. I know. There is another component, normal attrition, folks that would be leaving any organization. That attrition rate has been the same under this administration.

Frankly, it has been a little less under this administration than it was in the last year of the Carter administration. In terms of the 200 people we are proposing in our budget proposal reduction we can give you a breakout of essentially what people there would be in broad categories. I think we can give you that for the record.

Mr. CARNEY. I would appreciate it very much. I think that is the whole crux of the budget process now, as far as I am concerned.

Mr. Chairman, if I do have more time I would like to reserve it. In the meantime I would yield back to the Chair so our other colleagues would have an opportunity.

Mr. SCHEUER. Thank you. Very good. Congressman Brown of California.

Mr. BROWN. Mr. Chairman, could I ask you to recognize Mr. Gore first.

Mr. GORE. No, no, you go ahead.

Mr. BROWN. Mrs. Gorsuch, some of the questions which I am interested in have been raised already. We had some discussions when you were before us 6 months ago about the changes that you were making organizationally at EPA, your proposals to decrease what you considered the abnormal overhead and so on.

Could you just make a brief statement as to how you feel your success has been in reducing what I think was described as a 40 percent overhead in the ORD and streamlining the organization? Do you think you are achieving your goals satisfactorily?

Ms. GORSUCH. Mr. Congressman, I think we are on track. We do have a committee that has been established to take a good look at our laboratory facilities, our headquarters facilities, and then what we call our S. & A. labs, which are surveillance and analysis, kind of monitoring labs. The laboratory report will be coming to me first I believe. John can fill me in here. The S. & A. lab report will be coming second, sometime in the May timeframe. And we hope to have at least all the recommendations to me by summer of this year at which time I will be making some hard choices and some consolidation, I am sure.

But I think it is on track. I think the work that has been done to date, at least to the extent that I have seen it, has been well focussed, and we are making progress.

Mr. BROWN. When you appeared 6 months ago, I think you indicated that you expected within a year to have this under control. We reminded you that we would be asking the question in a year. This is just in the way of a progress report.

Ms. GORSUCH. I appreciate the nature of the inquiry.

Mr. BROWN. We are somewhat disturbed partly for parochial reasons about the reductions in funding for the air pollution research and air pollution health effects research. It is a major problem in our area of southern California, as you know.

You have suggested some of this reduction would be offset by the work of the Health Effects Institute. I am not particularly familiar with what is happening there, and I would like to ask you if you could briefly describe whether this has proven to be an effective instrument for mobilizing other resources, private and industry resources, in support of a national goal.

I would like the record to contain some information on that.

Ms. GORSUCH. All right, Mr. Congressman, let me say that our proposed reductions in air research are really a component of two major factors. One, a lot of our work in modeling has been completed. Two, as you know, Congress has said to put the National Ambient Air Quality Standards on a 5-year cycle for revision. In looking at what we had in prior years, we had each of those studies funded at essentially level funding for 5-year periods. What we are looking at now with this proposal is putting them on that cycle, both from a review point of view and from a fiscal point of view. More relevant—those are the major reductions that are in our air research area.

In terms of the effectiveness of the Institute, you may recall that there was a $1 million fiscal 1981 budgeting for that Health Effects Institute. Indeed, we were all hopeful that it would provide a vehicle with Government funding and funding from the automobile industry to answer significant questions especially on automobile health effects in terms of pollutants. I think it is fair to say that the jury is still out, that the Institute is really just beginning to get itself organized. We have from our end appointed a senior advisor to advise them of what we feel are the Government's needs for additional research. They will be analyzing that and then going forward. At the time that I visited with the leadership of the Health Effects Institute in the summer of last year, the $1 million which had been coming from the Federal sources was the major source of funding that they had received to date. They had not expended or obligated any major part of that $1 million.

So, while we are still being very hopeful that they can provide a vehicle, I think the jury is still out.

Mr. BROWN. I am a little disturbed by that. This Administration has put a good deal of emphasis upon cooperation of private industry in solving some of our major problems as a way of reducing Government expenditures.

Ms. GORSUCH. Yes, sir.

Mr. BROWN. The automobile industry, recognizing that it has serious financial problems, still has other serious problems which

could be addressed somewhat more effectively by a cooperative approach.

Can you tell me whether or not you intend to pursue aggressively the establishing of cooperative patterns with the industry in approaching this? Is this a hopeless cause, or as you say, is it something that you are unable to determine at this point?

Ms. GORSUCH. Well, Mr. Congressman, I think that the appropriate person to aggressively pursue this funding from the automobile industry would be the Institute rather than me as the Administrator of EPA. We feel we have at least done our share, if not more, to date. We are still enthusiastic that this might provide a vehicle to formulate our research needs, and then see what the leadership of the Institute is able to get from the automobile industry in terms of their cooperation.

Mr. BROWN. I will not pursue that further. Let me ask you about the study on crop loss assessment, from which there was recently a report which indicated substantially greater agricultural crop losses as a result of pollutants, primarily ozone, than previous studies had indicated. It disturbs me that we are substantially reducing that kind of research effort which has by no means peaked or achieved its major purposes.

Would you like to comment on what you perceive as the future for the funding for that kind of operation?

Ms. GORSUCH. Yes; Congressman, I would like to refer that question to Dr. Riordan who I think can give you a report in depth.

Dr. RIORDAN. Yes, Congressman Brown. The reductions you are talking about are associated primarily with the oxidant effects program. We are funding in fiscal year 1982 what we think is the last phase of the oxidant impact program. There we are attempting to gather the last few years of data associated with about 75 percent of the commercial crops in the United States. This is of interest to the program office from the point of view of setting the ozone standard and making a judgment on the welfare effects associated with ozone.

The program will continue, however, gathering information on the effects of acid rain and sulfur dioxide on crops and will be funded in 1983 at the level of about $1.1 million.

Mr. BROWN. How does that compare with prior years?

Dr. RIORDAN. From fiscal years 1980 through 1981, it was funded at about $2.5 million a year.

Mr. BROWN. I will not editorialize on the reduction, but obviously it concerns me a good deal. While you have the floor, could you address a parochial matter of the funding for the Ada research laboratory which was previously discussed as doing a great deal of groundwater research? While that is a small, inconspicuous lab, it is of great concern to some important Members of Congress and I wonder what is happening to it.

Ms. GORSUCH. Yes, Mr. Congressman, Dr. Hernandez is familiar with the lab and would be the best person to respond.

Dr. HERNANDEZ. Mrs. Gorsuch says that because I am such a strong supporter of that laboratory. I think we fully intend to keep it as an operating facility. We have added to our groundwater research in 1982 and 1983. We have a very valuable staff at Ada.

Mr. BROWN. Mrs. Gorsuch, possibly Dr. Hernandez is the best person to answer this too, but amongst the minor projects being terminated or apparently being terminated is the one involving aquatic weeds research. Again as I say, a parochial matter of interest to only a small number of Congresemen, but it is, again, not levelly funded, and a project which, depending upon how you look at it, might have considerable importance in the future. Just for the record, because I am sure it will come up during mark up, would you like to justify the termination of this program as being of insufficient national importance and express your own views with regard to the future of it?

Ms. GORSUCH. Mr. Congressman, I can tell you that the conclusion that it is not of sufficient national importance to continue funding is not the basis on which we are proposing completion of funding or zero funding. I think Dr. Riordan can give you a history of our activities to date, what we feel we have done in the area, where we think we have got conclusions and useful tools for the community at large to use.

I defer to him in that regard.

Dr. RIORDAN. Yes; in response to the directions of Congress, we have carried out work in the aquatic weeds area since 1978. We will have spent as of 1982 a total of $2.1 million in comparison to the grand total of $3.6 million which has been authorized by Congress over those 5 years.

We have carried out about 15 projects in the area of aquatic weeds assembling what we believe is the best available knowledge on the alternative techniques and cost of dealing with the aquatic weed problem.

In 1982, we will be devoting about a quarter of a million dollars toward assembling this information and making it available to State and local governments in a decision package. We think that that brings the program to a conclusion and that we have provided the scientific and technical data available to allow governments to apply these on an ad hoc basis in controlling the aquatic weeds problem.

Mr. BROWN. Am I to assume that you will prepare and submit some sort of a report including these recommendations?

Dr. RIORDAN. Yes, Mr. Chairman.

Ms. GORSUCH. Yes, Mr. Congressman, that will be our effort in 1982, to aggregate the information that we developed on how to control these weeds, put them in a usable form and have them available for dissemination.

Mr. BROWN. I don't want to anticipate the results, but you might consider recommending the establishment of a major new agricultural industry in raising geese which will eat the weeds.

Ms. GORSUCH. I do not know whether that was one of the alternatives we explored.

Mr. BROWN. Mrs. Gorsuch, we had some discussion at your prior appearance in October with regard to the fate of the epidemiological research in which you generally expressed the view that the funding was being reduced in this area, not because of the significance or importance of the research, but because the expense of maintaining quality research was so great that it should be at least shared by other concerned agencies.

I wonder if you could give us some update on your feelings about this and what is happening in the agency at the present time.

Ms. GORSUCH. I believe again Dr. Hernandez would best be able to tell you. I think we have established some good rapport with those people who do epidemiological work as a matter of course and do it on a larger scale where concern in the areas of research addressed are hypothetically scaled 100. Our interest out of that 100 may be 5; in identifying the 5 areas of our interest we would request them to do research into. John?

Dr. HERNANDEZ. I think we have entered into agreements and close working relationship with a number of Federal agencies that also have strong interest in this area where they have better capacities in terms of expertise and in terms of interest than we do.

Let me discuss one of those forms of epidemiology with you briefly. This is in the area of drinking water where we have moved out of the long-term chronic epidemilogy. The materials that we don't know about now are there in such small concentrations and only in certain kinds of locations that it is hard to denote any kind of cause and effect relationship without having a huge population.

America has such a mobile population it makes these studies almost worthless to do unless you have a large cohort. As I explained earlier on the formaldehyde issue, they are looking at 16,000 people, which is a very expensive tracking process. So, for EPA to continue to do that kind of thing is not a good idea. Let me tell you about some short-term epidemiology that I think would be of interest to you. This relates to farm laborers, where they are either subject to pesticides by moving into the fields after spraying or by picking crops that have been treated with a pesticide.

We have had a pilot program in Florida. We are going to move into Texas next year with this real-time test on people who may be exposed. We are using a patch test there as a real-time epidemiological test.

I think EPA's interest should be confined to that kind of shorter range study that has a high payoff, rather than those of longer term and leave those other studies to such as the National Cancer Institute.

Mr. BROWN. Do you see a value from a coordinated interagency approach to these problems?

Dr. HERNANDEZ. Yes, sir; and we do have that kind of effort. Let me give you an example of a couple of them. One of the things that I chair is the Task Force on Heart and Lung Disease and Cancer. We have, I think, seven or eight major Federal agencies that are a part of that group. We did a study this year to show how each of us contributes our moneys to the various kinds of research. And epidemiology is one of those where there is a significant dollar expenditure by the combined sources. By working together to share our information and research, I think we will achieve some of those goals that we have.

Mr. BROWN. Since you brought up the task force, as you know, that was mandated by law 4 or 5 years ago. It has been meeting. I understand that you are considering the future program for the task force. Amongst the alternatives is phasing it out completely. I wonder if you would care to comment on how you perceive that

and how it fits in with your expressed sense of the importance of interagency appoaches to these major problems?

Dr. HERNANDEZ. I think that one of the problems of the past is that we have these task forces where somebody like myself becomes a titular head of it, doesn't go to meetings, doesn't participate, isn't an active person in seeking coordination of our activities.

I found out about this in a rather strange way; when I was asked to sign the report in August 1981 to the Congress. That is when I found that I was the chairman. We have met about three times since then, and have another meeting coming up in April. We have decided that we should be much more aggressive; either let's work on this task force together, let's make it work, or let's get rid of it.

I believe the consensus is that it is worth maintaining, that we can be a very productive group together, and that there are useful functions in addition to research information transfer that we do. But I really believe you have to lay all those options on the table and decide whether or not you want to continue these programs like the task force. My personal involvement will continue.

Mr. BROWN. Well, Dr. Hernandez, you know that the initiation of such efforts as the task force is an effort on the part of the Congress to overcome some of the exact problems that you have been discussing here. Why they do not work is a mystery to us, as well as a mystery to you, possibly.

We are very much interested in saving money, of coordinating efforts, making sure we get the best possible research that addresses a broad range of problems.

When we find one system is not working, and trying another, that is called the pragmatic approach. If it is being sabotaged somewhere, we are interested in knowing why, and I hope you will be able to give us some satisfactory answers on that.

Dr. HERNANDEZ. I think we have got this one back on an active track again, and hopefully we will have some outcomes that will be positive.

In the past they have been. I think that as you go through these phases, you need to learn again how to work with each other. I think we are back on that track again, doing the kind of thing Congress wanted.

Mr. BROWN. My concern is we do not keep learning the same thing over and over again.

Dr. HERNANDEZ. Twenty years of experience, but they are all the same experiences.

Mr. BROWN. Yes. Thank you very much, Mr. Chairman.

Mr. SCHEUER. Thank you Congressman.

Now, Congressman Sensenbrenner of Wisconsin.

Mr. SENSENBRENNER. Thank you very much, Mr. Chairman. I know that Mrs. Gorsuch has to leave somewhere close to 11 o'clock, so I will attempt to compress my questions so that she can make her departure, as promised by the committee.

I have noticed in the summary of the budget estimates for the Office of Research and Development that the major reductions have taken place in the area of water quality. In fiscal year 1981 the estimate was $61,440,000. That went down to $45,090,000 for fiscal year 1982 and the President's budget has $27,710,000 for

fiscal year 1983, or a reduction of 39 percent from the 1982 level, which of course was a substantial reduction from 1981.

Now, I would like to amplify on the chairman's question. You said you would submit testimony for the record on exactly what is proposed to be done with the $27.7 million for research and water quality. I also ask you, has there been substantial completion of research in water quality to justify the reduction? First, in the last fiscal year to this one, and the proposal from this fiscal year to the next one?

Ms. GORSUCH. In terms of the specifications of what will be done with the proposed 1983 money, I would prefer to provide that for the record because it is quite detailed as you can imagine.

Mr. SENSENBRENNER. Yes.

[The information follows:]

EPA's water pollution research is broken into discipline areas. The major emphasis for the FY 1983 proposed budget is discussed below for each area.

Scientific Assessment

The research emphasis is on completing a health assessment and criteria documents for use in developing site-specific water quality criteria; developing lower cost, short-term test methods for waterborne pollutants and working with states in updating water quality standards.

Monitoring Systems and Quality Assurance

The industrial wastewater research program emphasizes the vigorous application of quality assurance procedures and methods testing needed to support implementation of the permitting program.

In addition, special attention will be given to development of accurate and reliable monitoring methods to improve the scientific quality of water quality data.

Health Effects

Resources will be used to fill potential data gaps for the priority pollutants, validate information used in establishing these criteria documents and develop short-term tests of toxicity and screening tests for toxic materials.

Program emphasis in municipal wastewater research concentrates in the areas of sludge mangement and Innovative and Alternative (I/A) technology which is consistent with the priority thrusts of the entire municipal wastewater research program.

Environmental Engineering and Technology

In the municipal wastewater research program, support for the I/A technology program has been increased to provide for more post construction evaluations of I/A projects.

Also research on plant operation and design has been increased to develop a design information series on improved plant operation.

The engineering research program in industrial wastewater has been reoriented away from effluent gudelines support, which is no longer required by the regulatory program, to evaluation of least cost pollution control technologies for permit compliance (especially for small economically disadvantaged firms).

Environmental Processes and Effects

Research will focus on developing water quality standards derivation guides (for use by states in determining attainable water quality uses and the necessary criteria), toxic wasteload allocations and predictive impact models, and ocean disposal impact assessment techniques.

Ms. GORSUCH. The reductions in large part, and I will ask Dr. Riordan to supplement my response, but in large measure do represent the completion of the research and development work on what we refer to within the agency as the effluent guidelines.

As you may recall, I believe it was 1976 or 1977.

Dr. HERNANDEZ. 1977.

Ms. GORSUCH. When Congress said the major effluent guidelines should be developed by the agency within a period of 2 years. That would have been sometime ago. To date, there is one major effluent guideline that has been proposed by the agency in terms of the industry that is regulated. That is the bad news. The good news is that the research and development phase of developing those guidelines will be essentially completed by 1983. We have got all the data, we have all the research done. It is a matter of collecting it, analyzing it, and transforming it into the guidelines the Congress requested.

That is one major completion of work by 1983. It is overdue by large measure. But at least it represents a milestone for us.

Mr. SENSENBRENNER. What percentage of the total water quality research budget was devoted to putting together those guidelines?

Ms. GORSUCH. I cannot answer the question you are asking, but the reduction between 1982 and 1983 represents a minus $4 million.

Now, I think Dr. Riordan can give you the other component parts of that reduction. I will ask him to do so.

Mr. SENSENBRENNER. Please.

Dr. RIORDAN. Yes. There is a reduction of $17 million in water quality in the period from 1982 to 1983. It is about $2 million in health effects, $2.5 million in ecological effects, $2.5 million in the Great Lakes program, $2 million in monitoring and measurement methods development, and approximately $7.8 million in control technology which covers the effluent guidelines support work, as well as the municipal wastewater areas, where we reduce the municipal wastewater research program in control technology about $4 million. Going back, if I could for a moment, to the effluent guidelines, I might point out we spent a total of approximately $50 million over the period of 1976 through 1982 on the effluent guidelines program. That was split about $30 million on engineering control technology and about $20 million on monitoring and measurements methods development.

This was associated primarily with the priority pollutants we now have, and mass spectrograph methods for measuring these in the ambient and effluent waters.

Mr. SENSENBRENNER. Thank you. On page 3 of your prepared statement, Ms. Gorsuch, you state that the goal of research is implementation, not just research for the sake of research.

Can you give some specifics on how some of the research has been implemented and also if a determination has been made that some of the research cannot be implemented as a justification for a reduction in the budget?

Ms. GORSUCH. Going to your query, what has been done that can be implemented, we feel good that the research and development for the effluent guidelines will finally provide a basis on which we can provide what Congress requested of us, i.e., guidelines that con-

trol the effluents from industry into the waters of the United States. That research has been ongoing. It will be completed and we will be able to translate that into real implementation, the regulatory nature that is really the foundation of our agency.

Other instances where we have completed research, and there is a list of things, Courtney will give you part of it, and I will give you part of it. But we also feel we have completed the work essential in terms of the Chesapeake Bay to monitor and understand what is necessary to protect the water quality in that particular area. That will come to a point of fruition in 1982.

In terms of instances where we have research that has not been applicable, I am a little hard-pressed. I am going to have to ask Dr. Hernandez or Dr. Riordan to assist me there. I think the main thrust of what I was trying to convey to the committee is that our mission as Congress has given it to us, is to regulate, is to control air, water, and our use of land. We perform our R. & D. efforts as preliminary to those controls. If we have not done that, we have failed, because we have not gotten to the job at hand, which is to control the use through regulation.

Dr. Hernandez, can you elaborate on the second part of the Congressman's question?

Dr. HERNANDEZ. I can think of some good examples from the area that you started on, Congressman, that is, the water quality area, where there are laboratory-derived numbers for the toxicity of the 65 criteria pollutants. We published those, then we found out they were not very useful, as we were trying to apply laboratory-derived numbers out in the real world. Where there are changing climates and different geographic settings, we found out they did not apply. Now we have to go back and do field work to help the States apply these criteria.

Ms. GORSUCH. Another area where we spent a good deal of research and development money produced a model that is of limited usefulness. After using it, we found out it is too complicated for many States to use, which was the essential reason for having it. It is also proving to be too complicated for our own applicability. So, that is another area where we have indeed done research but it is not satisfactory to our needs or the use of the States, where we hoped for its greatest application.

Mr. SENSENBRENNER. As one who represents the district reporting commission, I have been hearing from some of my constituents expressing concern about the rather sharp reduction in authorizations requested for various Great Lakes programs, such as the two-thirds reduction in funding in the Great Lakes National Program Office Region 5, located in Chicago, and the Large Lake Research Station in Grosse Ile, Mich., is scheduled for termination.

Again, have these projects largely completed their mission? What justification is there for terminating one station and cutting back two-thirds of the budget for the second?

Ms. GORSUCH. Well, Congressman, Grosse Ile is a very small laboratory facility that houses about eight people. I have to ask Dr. Riordan about the overhead figures.

In terms of our proposal, we feel that the work in Great Lakes research can be done through consolidation of people who are locat-

ed at Grosse Ile into our Duluth laboratory, which is a much larger facility.

I think that facility has about 75 people. So, it is not a question of, is the research worth doing, but rather does it make sense from a management point of view to have a facility of such a small size located with a commensurate overhead when indeed the Duluth laboratory is nearby and obviously on the Great Lakes, too?

Mr. SENSENBRENNER. How about the issue of the cutback in the funds for the Chicago office?

Ms. GORSUCH. I was about to address that. That is what we call abatement, control, and compliance. Essentially it is a monitoring effort, monitoring the tributaries and the other sources to the Great Lakes. That has been an ongoing effort administered by Region 5.

I would like to refer to Dr. Riordan, if I may, as to the reasons for its reductions. I know we are proposing that we continue at a reduced level, but at a level of about $3.1029 million.

Can you address the reasons for the reductions?

Dr. RIORDAN. I will try. The abatement control decisions have been made by the program office. But I am sure it is related to the status at the present time of the phosphorus control program and the extent to which it is felt that the United States by, means of control by municipal waste treatement plants, is adequately meeting the phosphorus constraints or limits on phosphorus contributions from point sources.

I think that lies behind the availability to reduce the amount of monitoring for the tributaries.

Ms. GORSUCH. We will be happy to provide for the record a more detailed response. Courtney is not prepared to answer it, so we will ask the program people to prepare an answer for the record.

[The information follows:]

The Agency's Great Lakes Program request of $3,813,500 in the 1983 President's Budget is 30 percent lower than the 1982 Current Estimate of $5,248,000 reflected in the 1983 Congressional Justification. The 1982 Current Estimate includes the $1.5 million Congressional add-on which represents the major difference between the 2 years.

In 1982, the add-on is being used for Great Lakes monitoring and for demonstration grants. Approximately $800,000 will be used to monitor pollutant loadings from tributaries to the Lakes during high flow events and to augment the toxics monitoring program by providing analysis of fish, sediments, and air deposition samples for toxic substances. Approximately $700,000 will be used for projects to demonstrate new and innovative means of controlling non-point sources of pollution.

The 1983 request, we believe, is sufficient to maintain a United States focus for activities of the United States Government under the Great Lakes Water Quality Agreement.

Mr. SENSENBRENNER. As one who has been very interested in trying to control the problem of acid rain, I am pleased to note that there is an increase in the budget for acid rain research.

Could you please outline for the committee, what is proposed to be done with this increase, specifically answering questions that I am sure many of my colleagues, as well as I have about tagging the actual sources of acid rain and trying to get a cause and effect relationship between acid rain that falls in the Adirondacks and southern Canada to what we suspect is coming from the Ohio River Valley?

Ms. GORSUCH. The area of concern, cause and effect, is really at the heart of the issue. If we control what pollutant, what effect will we be able to predict in terms of the control of the phenomenon, which is the acid rain issue?

In a broad sense, our request to Congress for a 33 percent increase in our acid rain budget is commensurate with our commitment to accelerate research so we can come to grips with the real questions at hand: What is it that goes up? How far is it transported? How does it come down? How does it impact on the ecological system it comes down on? What is the cause and effect relationship?

You should know EPA's research in this area is only part of a governmentwide research. We have made a commitment at EPA to accelerate our research to the extent possible to come to grips with those unknowns.

We are fairly cognizant that we always operate on the edge of scientific uncertainty. That is the nature of science because we will have no new issues and no new answers to the questions. But the parameters of the unknowns, in answering your question, are really tremendous at this point.

Courtney, can you detail for the Congressman where we will be spending the additional moneys in terms of meeting that commitment to an acceleration of research?

Mr. RIORDAN. In our present plan, the allocation of those funds is between the five major areas of research: Manmade sources, approximately a $250,000 increase; atmospheric processes, the transport and transformation of the acid particles and rain, $760,000; deposition and monitoring, approximately $365,000; health and environmental effects, $800,000; and assessment activities, $824,000.

However, I should point out that right at the moment I think that the real problems are the sources of these acid particles or acid deposition that we are measuring in various parts of the country, and the impacts of the acid deposition, dry and wet, on soils and ultimately on lakes.

We are going to be revising the plan. Right at the moment there is an operational plan that is under development under the aegis of the Interagency Task Force on Acid precipitation. We expect there may be some marginal shifts in research moneys so that this policy-oriented research program will focus on what we consider to be the major questions associated with the acid deposition problem.

Mr. SENSENBRENNER. As a matter of record, I was not invited to attend the meeting with the Canadian parliamentarians that the chairman referred to, but I did go to Lake Placid with this subcommittee last September, and we spent the morning eating with Canadian parliamentarians.

The problem of national government provincial relations is a problem in Canada, just as the problem of Federal Government-State relations is here.

My understanding of the Canadian constitutional system is that control over energy and control over pollution is exclusively the province of the provinces in Canada. So there is less that the Canadian National Government can do under their system of government to make the provinces shape up than there is that we can do as a national Government to make the states shape up.

I think that the record ought to be clear that the problems of federalism are on both sides of the board, not just ourselves.

Ms. GORSUCH. Thank you, Mr. Sensenbrenner.

Mr. SCHEUER. For the last member of this congressional panel, Congressman Gore of Tennessee. Congressman Gore is chairman of the Oversight and Investigations Subcommittee of the Science Committee, and he and his subcommittee jointly chaired the last meeting we had with you in October. He has had a continuing, sustained interest in the work of EPA.

Congressman Gore?

Mr. GORE Thank you very much, Mr. Chairman.

Thank you and my other colleagues here for the courtesy in allowing me to participate here this morning.

I thank you for being here, Ms. Gorsuch. I have been in the past, critical of your stewardship. I continue to be so, but I assure you, as I hope you fully understand, that there is nothing personal whatsoever in that criticism. I do have an extremely serious concern with what is happening at EPA. When we talk about R. & D., those concerns are not diminished. They are, in fact, heightened.

I am troubled because I see the destruction of a major portion of EPA's capabilities. We have seen in the latter part of this century a recognition by the American people in both political parties and of all ideological persuasions of the tremendous problem that we are facing with our environment.

In Republican as well as Democratic administrations we have seen initiatives to try to deal with those problems. As we have dealt with them, we have found that it is a complex task and we have found the need for more research and development to give us a better ability to perform those tasks.

Industry at times has been inconvenienced and even angered by these efforts. There is a mood now that seems to be a mood that this may be industry's last opportunity in this century to undo what some of the actions that have been taken in the last decade were, and they are going to persuade this administration to do as much damage to that apparatus as possible during the remaining 3 years of this administration.

You mentioned a 12 percent cut in the budget, for example, but actually that reflects a cut from last year, and from the 1981 figure it is far more dramatic than that. When you talk about R. & D., it is twice as much.

You say the morale problem is mostly over with now. That just conflicts with what the reports coming out of the agency are. You tell the chairman of this subcommittee that not only have you not appointed ahead of the R. & D. effort in the last 13 months, but that you have no plans whatsoever to even recommend the appointment of one at any time in the near future.

It is very troubling, Ms. Gorsuch. As you know, I have asked you in the past about specific things that trouble me. I wanted to follow up this morning on a couple of things that the chairman mentioned. Let me ask you first about your response to him on nonpoint pollution.

You have dramatically cut the efforts on nonpoint pollution, and I believe you said that deals, of course, with things like mine drainage, urban run-off, run-off from eroded lands. I believe your re-

sponse to the chairman was that you were hopeful that the States would undertake this effort, that under the construction grant program it should be undertaken.

Is that correct, Ms. Gorsuch?

Ms. GORSUCH. The nonpoint source pollution effort, section 208 funding, as it is referred to, did call for regional and State planning. It has come to an end. Those plans have been formulated or adopted or not, as may be the case.

My response to the chairman was that there is additional money in the construction grants program for the State's management of their programs. In some States we think those moneys will be used where there are nonpoint sources to examine the possibilities of additional controls, yes.

Ms. GORSUCH. If I may ask Dr. Hernandez to follow up on that?

Mr. GORE. Are you familiar with the legal requirement that 98 percent of that money cannot be used for such purposes?

Dr. HERNANDEZ. I think she is talking about the 205(j) money, just put in the Construction Grants Amendments of 1981 by the Congress for the purpose of planning and coordination of water quality. This was to replace 208 money, which had been ongoing since the early and midseventies, where a significant sum of money went into the planning process of nonpoint sources of pollution.

One of the problems with that whole process was that the organizations charged with doing that planning were not the ones that had the political capabilities of carrying out the plans.

There was a lack of linkage between those that were allocated moneys for waste water treatment facilities, those that had the political power to tax and spend and the agencies doing the planning.

It became apparent that the best use of those moneys had been served; that is, the basic planning.

Mr. GORE. Let me ask you for a brief answer to this question. Either yes or no is fine. Do you really believe that the States are going to do that research?

Dr. HERNANDEZ. This is planning, not research.

Mr. GORE. Who is going to do the research?

Dr. HERNANDEZ. Basically that has been done. We are in a demonstration phase now. We have an ongoing program in Great Lakes States on nonpoint source pollution from farmlands and on urban runoff. These things are no longer in the research phase but are in the demonstration phase. It is now up to somebody at a local level to decide whether or not an existing situation should call for implementation.

Mr. GORE. Throughout the testimony and throughout the budget justification we have these repeated references to research being completed. For example, in the area of toxic substances. You have a drop of 18 percent just from last year's figure and you say there, too, that this quote results from the completion of many of the test methods required for implemention of the Toxic Substances Control Act.

But it is not true. It is just not true. TSCA, in the section on developing test standards, for example, refers to the agency press describing standards for carcinogenesis, mutagenesis, cumulative effects and synergistic effects and any other effect that may present risk or injury to health or the environment.

You have not completed those, have you?

Dr. HERNANDEZ. I think by the end of 1982 we will have completed 69 of those test rules. I am not an expert on this subject.

Mr. GORE. Have standards been prescribed for teratology, for example, or mutagenesis or behavioral effects?

Dr. HERNANDEZ. Can we call on one of our staffers, who actually does that sort of thing?

Mr. GORE. That is fine with me.

Dr. CORTESI. My name is Roger Cortesi, and I don't know.

Mr. GORE. Mr. Cortesi, are you the person who is supposed to know?

Dr. CORTESI. No, I am not. The promulgation of standards is a duty of the program office, the office of toxic substances.

Mr. GORE. Well, they have not been implemented. The answer you can provide in an elaboration for the record, but I am informed that reliably the answer is no. You just say there they are completed. They are not completed.

Dr. RIORDAN. I might give you an example of some of the work that we have completed.

[The information follows:]

By June of 1982, the Office of Pesticides and Toxic Substances expects to have completed and available for public distribution 69 test methodology guidelines for use in imnplementing Section 4 of the Toxic Substances Control Act. These guidelines are currently undergoing Agency review. A substantial amount of research effort was devoted to the development of these guidelines, and research will continue as additional guidelines are developed.

The guidelines can be grouped into the following categories: 18 test methodology guidelines for general health effects; 18 test methodology guidelines for mutagenicity effects; 3 test methodology guidelines for neurotoxic effects; 21 test methodology guidelines for environmental effects; 9 test methodology guidelines for physical, chemical, and environmental persistence of characteristics tests.

Mr. GORE. I am sure there are some things you have completed. But when you say that this task has been complete and it has not been complete, then your justification for cutting it out is just a false flap.

Ms. GORSUCH. What are completed are the research components involved in issuing that regulatory product. Not all of the things we are listing as completed have been completed to date. You will recall this is a budget request for fiscal year 1983. So we are predicting completion of some work that indeed will be completed between now and the beginning of that fiscal year.

Mr. GORE. You say it results from the completion. You say that the research component has been completed.

Ms. GORSUCH. It will have been by the time that this budget would become operational.

Mr. GORE. You say that it results from the completion.

Ms. GORSUCH. Correct.

Mr. GORE. Well, that is not what you just said.

Ms. GORSUCH. Congressman, all of these budget figures are based on 1983 needs. We do, therefore, contain projections of work that will be ongoing in 1983. They are not representations of current day status.

Mr. GORE. Yes, and they don't reflect the additional new responsibilities that the agency is picking up, either. You are slashing the budget for EPA at a time when the responsibilities you are asked to assume by the Congress are greatly increasing with hazardous

waste and toxic substances and in your presentation that is not reflected.

You stated in your guidance to your senior managers that you were going to rely more heavily on the regions to do a lot of this. Let me read you from your memo to your senior agency managers, your budget justification, giving them guidance.

You say, "You should prepare to expand your technical assistance and technology transfer activities through increased contact with the regions." But here again, your budget for technical information and liaison work with the regions has been cut dramatically.

So, how can they expand the shifting of those responsibilities to the regions when you cut that dramatically?

Ms. GORSUCH. First of all, Mr. Congressman, we do not have great new statutory responsibilities. As I indicated in my opening statement, the statutory responsibilities where we derive our work is from Congress. They are not brand new. They are almost a half a decade old.

Mr. GORE. What about Superfund?

Ms. GORSUCH. That is new.

Mr. GORE. What about RCRA, isn't that new?

Ms. GORSUCH. No, it is not.

Mr. GORE. It has not been implemented, has it?

Ms. GORSUCH. Not fully.

Mr. GORE. What about TSCA?

Ms. GORSUCH. RCRA is about 5 years old. TSCA——

Mr. GORE. Is the Agency's implementation of the law new? Your responsibility—the responsibilities that you are assuming and fulfilling are new. The law, yes, it was passed several years ago, but the agency has not yet implemented the law, and the responsibility to implement the law is new, is it not?

Ms. GORSUCH. Well, Congressman, I think you are correct. There was an incredible backlog of work that I inherited when I walked into that Agency that had not been done that was required by Congress.

You will also, if you read my management guidance, find out that I directed our senior managers to (a) concentrate on our statutory responsibilities and (b) clear out the backlog.

Now, those are not new responsibilities. They are largely old responsibilities that are overdue. We are addressing that backlog very vigorously.

Furthermore, we are not "slashing" the budget at EPA. Our overall operation and research program, as I indicated to you, represents a 12-percent decrease from 1982 levels approved by this Congress.

This is again against a backdrop of an agency that increased by 62 percent between 1977 and 1980 when, indeed, there were new responsibilities.

Now, in many respects we are able, because of those heavy investments made during those years, to capitalize upon the results of those works. In effluent guidelines, our research and development efforts and investments will allow us to finally get on with the business Congress gave us, to issue guidelines in that area.

The same is true, largely in TSCA. In RCRA full implementation is not complete.

We continue to have that as a high priority, as well as a priority in our research budget. Where we have new programs that have not been implemented, you will find a high level of commitment. Where we have more mature ones where we feel the work is largely completed, we are requesting reductions.

Mr. GORE. Well, your actions speak far louder than your words, Ms. Gorsuch. The words are pleasant to the ear, but your actions are devastating to the ability of this Government. To implement those laws and to say that the Agency has not perceived major new responsibilities is just flying in the face of historical record which is obvious for all to see.

I don't think it is necessary to dispute the fact that in hazardous wastes and TSCA that the Agency is being asked to assume new responsibilities; it is self-evident.

On the question of health effects related to energy, you have cut that from $15 million to—you requested zero and then OMB indicated that you went too far and put $2.3 million back in.

Now you have sat and told the chairman that the justification for that was that you didn't want to get ahead of the development of synfuels.

Yet the thinking of the Congress in establishing the synfuels program and in asking EPA to look at health effects, was that your effort to determine the health effects should be built into the design of these projects so that we wouldn't have the massive environmental problems that so many have predicted to accompany synthetic fuels.

Isn't it a little shortsighted to virtually eliminate the health effects research into synfuels?

Ms. GORSUCH. I will refer to Courtney to respond to your question, Congressman.

Mr. GORE. Before going to him, it is your decision. We, you and I, have talked about it in the past. I know you are familiar with it.

Don't you think that is a little shortsighted?

Ms. GORSUCH. I have responded to the general question here to the chairman. I am simply seeking not to repeat myself. We feel that our work and our investment to date have provided us with sufficient information to respond to the industry as it comes on line.

As I indicated, and I beg the committee's pardon for repeating myself——

Mr. GORE. What about the public? Instead of responding to the industry?

Ms. GORSUCH. It is the industry that will create whatever public problems there are. So it is the industry that we regulate. We have invested in excess of $30 million in researching, based on pilot projects what the environmental effects of the start of the energy industry might provide.

We feel that we are far ahead the actual industrial development and that our work would be better advised to be applied to those projects as they are actually developed rather than based on pilot technologies which may or may not reflect the development of the particular industry.

Likewise, we are focusing our efforts in this regard to providing technical assistance to the people who write the permits. Those are the people in our regional offices and in our States who need to respond to real needs, real permits for both water and air. Courtney can respond to that in terms of what our health effects research has produced to date and why we feel specifically that we are at a point where our resources do not have to be as intensive as they have been in the past.

Mr. GORE. Let me say before you do this that it is not confined to synthetic fuels. It is all energy-related health effects.

We are seeing a massive shift to heavier oils being used, as opposed to lighter oils. We are seeing increasing concern about the health effects of scaled-up coal usage; the American people have an increasing concern about all of these questions and yet your effort to look into them and to find better solutions is just being destroyed.

Ms. GORSUCH. I cannot accept that characterization. Your assumption that our concerns with energy development are only based in our research and development that is "marked energy" simply is inaccurate.

Obviously all of our research in air and all of our research in water and all of our research in lands has application in the development of energy as a particular industry, as it does to all other industries. Therefore, it is ongoing.

The component part of our research budget that is specifically broken out for energy was devoted to a particular problem at a particular time. In terms of the conventional pollutants, we certainly know a great deal through our air, water, and other programs. In the synfuel program, we really feel that we are ahead of the development of the industry.

Mr. GORE. All of those other items have been devasted also, so I mean you can't really look there to get the work done.

Ms. GORSUCH. Would you like to elaborate so the Congressman has a clear idea of what is being reduced and why.

Dr. RIORDAN. I would like to say that from 1975 up until 1983 we will have spent about $860 million on the energy program, of which about $65 million was in the synfuels area.

I will not go through an elaboration on what the synfuels area research program was. But I would like to say that basically in examining the synfuels program, we were looking at a variety of development processes that may or may not be ultimately commercialized.

We were then analyzing the waste streams from those developmental processes, identifying chemicals and mixtures of chemicals that were then subjected to tests.

In examining that program, we came to the conclusion that that was in fact anticipating development. We were carrying out research on speculative chemicals and speculative mixtures of chemicals that may or may not materialize in the future, depending upon when and how the synfuels energy program ultimately is adopted by the economy.

One example further. We were taking projected synfuels themselves and using those in combustion processes and then carrying

out tests on the combustion products Our estimate was in that area that we were just too far ahead of the development of the industry.

We knew what the characterization of the examining developmental processes were and we would be prepared at a later time to fully characterize effluents that would emerge from actual commercial plants.

In terms of the conventional combustion, Ms. Gorsuch is correct. We have increased, in fact, the research in the air program dealing with sulfur dioxides. That is the area of primary concern from the conventional combustion industry.

I think if you look over our program carefully, you will find out that either we were anticipating problems and therefore could justify reduction or, in some instances, in the energy program, we were carrying out research which was very fundamental.

In terms of focusing needs in our research on EPA, we were able, I believe, to justify reductions in those areas.

Mr. GORE. Well, Mr. Chairman, I don't want to impose any further on the subcommittee's time.

Let me conclude by reciting briefly the other areas that Ms. Gorsuch mentioned as possible sources of this work being done.

She says we can't just look at the energy budget, which is being almost completely eliminated, but you have to look at the other health effects efforts going on.

Air has been cut 3 million; water quality cut 2 million; drinking water has been cut 1.8 million; hazardous wastes, health effects has been cut, radiation has been cut, virtually every single one of them has been cut from $8 to $12 million out of the health effects category alone.

I think the direction you are headed in is clear. I think that the No. 1 priority of your regime at EPA is to make absolutely certain that no company that is affected by the laws that you are supposed to administer is in any way unhappy with any action that EPA takes.

If you can accomplish some other goal along with that goal, then you will try to do so.

If the public outcry reaches a crescendo, then with some fancy footwork you will say, well, wait a minute. We will add a little bit here and a little bit there. But the direction remains the same.

And that is my assessment and again it is not personal, Ms. Gorsuch——

Ms. GORSUCH. That sounds very subjective, Congressman. I am, of course, disappointed——

Mr. GORE. It is not directed at you as an individual. I think you are implementing exactly what the administration wants you to do. I see the same approach in other areas.

Ms. GORSUCH. I want to say I am both personally and professionally disappointed in your assessment. That is not the objective of the Environmental Protection Agency.

Our objectives have been set by Congress. They are contained in the various laws you have given us to implement. We intend to do that consistent with the administration's principles.

This is nothing that I am telling this committee for the first time. I have told the world at large. Those principles again are very clearly stated: economic recovery consistent with our environ-

mental goals, reduced Federal spending, better relationship between the Federal, State and local governments, and regulatory reform. We are indeed committed to our priorities, which are statutory responsibilities consistent with those administration goals.

Mr. GORE. I wish to thank you and the subcommittee for its courtesy.

Mr. SCHEUER. Thank you, Mr. Chairman.

Ms. Gorsuch, you have been extremely patient with us. I have one observation to make following Congressman Gore's testimony.

There seems to be some concern as to whether your Agency will meet the R. & D. responsibilities which it is mandated by statute to meet by the end of the fiscal 1982 year, because nothing has been done to maintain that.

You are assuming that much of it that hasn't been done will be done by the end of the 1982 year. I will concede that you did inherit a tremendous backlog. I sympathize with you.

Would it make sense, therefore, for us to invite you back here for a morning just before the end of the 1982 fiscal year? So that we can ascertain whether your confidence and your assumption that the research that you are mandated to do in the 5-year plan and the rest of it have, in effect, been completed by the end of the 1982 year?

Your assumption being that it will be, because you have not provided any budget for these ongoing activities in 1983. If we find that some of these functions have not been completed, that you hope and expect will be completed, would you then be amenable to perhaps submitting a supplementary budget request for 1983 to continue whatever statutorily mandated research programs that you are faced with which haven't been completed in 1983 and to provide some additional funding in 1983 to complete those projects?

Would you be amenable to coming back here and letting us, together, evaluate whether your hopes and expectations have in fact been fulfilled?

Ms. GORSUCH. I appreciate the sense in which the offer is made. Let me suggest an alternate date. Wouldn't it be more appropriate to do that once our 1983 budget is passed by Congress? I mean in the spirit of levity?

But certainly we would be happy to come back and testify as to our progress in terms of our research components. As to requesting a supplemental, I have no hesitancy in doing that, if any lack of progress can be related to resource needs. Let me give you an example.

In the effluent guidelines category which has been fully funded by Congress in the past and indeed beyond what the program has requested, the program has consistently failed to meet the timetables for issuing those guidelines.

So, when we came into office, we looked at it. Is there a resource need? Is there a dollar need? Is there a manpower need?

In fact the need is not dollars or manpower. It is some sort of rational decisionmaking process.

Mr. SCHEUER. Where?

Ms. GORSUCH. In this one particular effluent guideline.

Mr. SCHEUER. Rational decisionmaking by whom?

Ms. GORSUCH. By all parties concerned in the development of these guidelines. Once we put down on paper what the decisionmaking process was, there were arrows running this way, while they were running that way and so were going off the charts.

It was a miracle that men of good will could come to any decision.

So in that particular area it is not a resource problem. It is one of coming to grips with the process, instituting good management, and establishing a decisionmaking process that works. But I have no hesitancy in coming before this committee or any other for requests on the supplemental if I think there is a resource need.

Budgets are very hard to work with. They are my better guess, your better guess and efforts. We work on projections. We are proud of what we have got.

We are not hidebound to any dollar figure, but we think we are going in the right direction.

Mr. SCHEUER. Thank you very much. We appreciate your forthcoming posture. You made the best of what you undoubtedly realize some of us think is a poor case. You struggled valiantly. We look forward to seeing you in the fall. Any last words?

Mr. CARNEY. I would like my 5 minutes if I may.

I would simply like to make this observation, Ms. Gorsuch, that it is obvious that Congress has not looked at the effectiveness of the EPA for the past 10 years. They have taken a very, very quick solution to this and that is to pour more money into the EPA.

EPA has taken, what I think to be not, the high road; they have not been effective; we have not looked at that. EPA grew 62 percent from 1977 to 1980. This Congress still thinks the best way we can solve those problems is to pour more money into them. I have to commend you for looking at something instead of looking whether it is more money or less money; you are looking at effectiveness.

I would caution you that if no effectivenss is seen from the EPA in the next year, that certainly next year's hearings are not going to be comfortable for you or for people of this committee.

But you certainly are due your justice; you should be allowed to carry out your program. Let's see if it works. I have the confidence it will work. Hopefully we are going to find the answers. I know the chairman has some specific areas that he is very concerned in. So am I.

The various—ocean dumping versus landfill, clean air, acid rain; we are all very concerned. I am pleased to see you would come back if you see some necessity to look for more funding from the Congress.

I am sure you will agree the Congress would be receptive to that and probably back your requests.

But again, I think what we have to stress is that it is not an amount of money; it is the amount of effectiveness that an agency can produce. I would hope that under your stewardship, it will be a heck of a lot more effective than it has been for the last 10 years when it got all of the money it wanted.

That is my closing remark. I would like to thank the chairman for having you down here today. It certainly has been of great assistance to us.

In 2 weeks' time we will go into marking up this bill.

Mr. SCHEUER. Thank you, my colleague. I would only add a final pleasant sentence: In evaluating the remarks of the growth of the agency during 1972 to 1980, you had added to your pallet five major congressional programs for which you had responsibiliites, including the Toxic Substance Control Act, Resource Conservation and Recovery Act, the Superfund.

It is quite clear that these programs were not expeditiously encompassed and met by prior administrations; you did come to your job facing an enormous backlog. We sympathize with you there, but we must say that we are faced with a condition and not a theory, as Grover Cleveland said over a century ago.

The condition is that it is our perception that the agency has not met its statutory mandate from this Congress, it has not completed these projects due to no particular fault of yours, because much of this accumulated prior to your taking office.

So I think it is this backlog of responsibility that accrued to you, as I say, without any blame or fault on your part, that we fear may remain unmanaged and unmet by the end of this fiscal year.

We welcome your assistance to us in evaluating what kind of additional funding may or may not be appropriate in terms of a supplemental request.

We look forward with pleasure and anticipation to chatting with you in the latter part of September, before the September 30 expiration of the 1982 funding?

Ms. GORSUCH. Thank you, Mr. Chairman. Don't let me mislead this subcommittee or any other. I think we will be working on the backlog situation that we have for a good long time. It will not be completed in every program by fiscal year 1983.

In terms of our research needs and how those are reflected in what we think will be completed work, we will be happy to make a report to the committee in those areas.

But, when you get into things like the water permits, I believe that when we came in there were 10,000 to 12,000 thousand water permits which had expired. I can't represent in good faith to this committee that all 10,000 of those permits will be issued. But to the extent that we represented that certain areas of research have been completed, which will enable us to terminate them, if there is any change I will be happy to report to the committee on the status of that at the beginning of fiscal year 1983.

Mr. SCHEUER. Very good. We appreciate that and your patience and forbearance and good humor. Thank you very much.

Ms. GORSUCH. Thank you, Mr. Chairman.

Mr. SCHEUER. Is there further testimony?

Dr. HERNANDEZ. I think that by and large we have covered most of the substance. We do have citations of completed work and work to be done, but I am not sure that we should prolong the hearing.

We could put it in for the record.

[The information follows:]

## Air

| Decision Unit | Item |
|---|---|
| Oxidants | - Completion of some health research on photochemical oxidants for the updates of the criteria documents. Completion of portions of NCLAN program and first-generation work in urban photochemical model. |
| Mobile Sources | - Completion of health research in support of the diesel particle risk assessment program. |
| Gases & Particles | - Environmental Processes research supportive of the updates of $SO_x$ and TSP criteria documents. With the completion of this round of research for the review of standards work has been cut back (includes NCLAN and some modeling too). |

## Water Quality

| Decision Unit | Item |
|---|---|
| Water Quality Non-Energy | - Water quality criteria documents for the 65 priority pollutants are completed.<br><br>Performance Evaluation Trials and other quality assurance and monitoring work are reduced and transferred to the States.<br><br>Completion of research on recreational waters; completion of the arsenic epidemiology feasibility study; completion of methods for conducting toxicological bioassays; and completion of research on several individual compounds.<br><br>Completion of many environmental processes and effects projects that supported the development of water quality criteria documents for the 65 priority pollutants.<br><br>Research on eutrophication of the Great Lakes is completed. |

| | |
|---|---|
| Municipal Wastewater Non-Energy | - Projects in the municipal wastewater research and development program that are or will be completed in FY 1982 include: evaluation of sludge disposal methods, development of aeration devices, disinfection research, evaluation of toxic effects of municipal wastes, and many urban runoff abatement methods. |
| Industrial Wastewater Non-Energy | - Research support for the development of effluent guidelines will be completed during FY 1982.<br><br>Many research projects in developing and evaluating analytical methods and monitoring techniques for inorganic and organic pollutants in industrial effluents will be completed during FY 1982. |

Drinking Water

| Decision Unit | Item |
|---|---|
| Drinking Water Research | - Health Effects phase-out of the epidemiology program in FY 1982 because the health end-points of concern to EPA are being studied by other federal agencies (e.g., NIC, NIOSH, NHLBI, NIEHS).<br><br>Environmental Engineering completion of some projects in FY 1982 in the microbial and inorganic treatment areas, e.g., report on non-disinfection controls of bacteria; such as ozonation, ultra violet rays, and physical removal. |

## Pesticides

| Decision Unit | Item |
|---|---|
| Pesticides Non-Energy | - Less in-house risk assessment support required by the Office of Pesticide Program in FY 1983. |

## Toxic Substances

| Decision Unit | Item |
|---|---|
| Chemical Testing and Assessment | - Much of the research for the initial implementation of the Toxic Substances Control Act test guidelines has been completed. |

Energy

| Decision Unit | Item |
|---|---|
| Gases and Particles Energy | - Completion of visibility modeling efforts. |
| Water Quality Energy | - Completion of work with FY 1982 funds. Additional research, if required, will be funded in base program. |
| Industrial Wastewater Energy | - Completion of work with FY 1982 funds. Additional research, if required, will be funded in base program. |
| Multi-media Energy | - Completion of work on mining and reclamation. |
| Oxidants Energy | - Completion of $NO_x$ control technology assessment to support industrial process heater $NO_x$ regulations. |

Superfund

| Decision Unit | Item |
|---|---|
| Hazardous Substances Non-Energy | - Decrease represents the completion, or near completion, of several engineering and environmental processes projects required to support initial Superfund implementation efforts. |

Mr. SCHEUER. Why don't you think about doing that? We will have, I am sure, a number of written questions to give you and hold the record open. You can either give any further information that you wish as an answer to these questions, or you can submit further statements for the record.

Mr. CARNEY. I would agree with that and I would like to thank Dr. Hernandez and Dr. Riordan for the great preparation they went through to move forward to the markups.

I appreciate working with George Kopp and the staff. Mrs. Gorsuch, have helped us immensely in our requirements to pass out the bill. I know that you have sat there for a while with presentation you intended to give, but I think we touched on all of it.

If there are any further questions, Mr. Chairman, we can hold the record open.

Mr. SCHEUER. We recognize your past and present cooperation and I join with my ranking minority member in thanking you for the testimony.

We will be happy to accept any further information that you care to give us.

With that this hearing is terminated.

[Whereupon, at 11:50 a.m., the subcommittee was adjourned.]

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